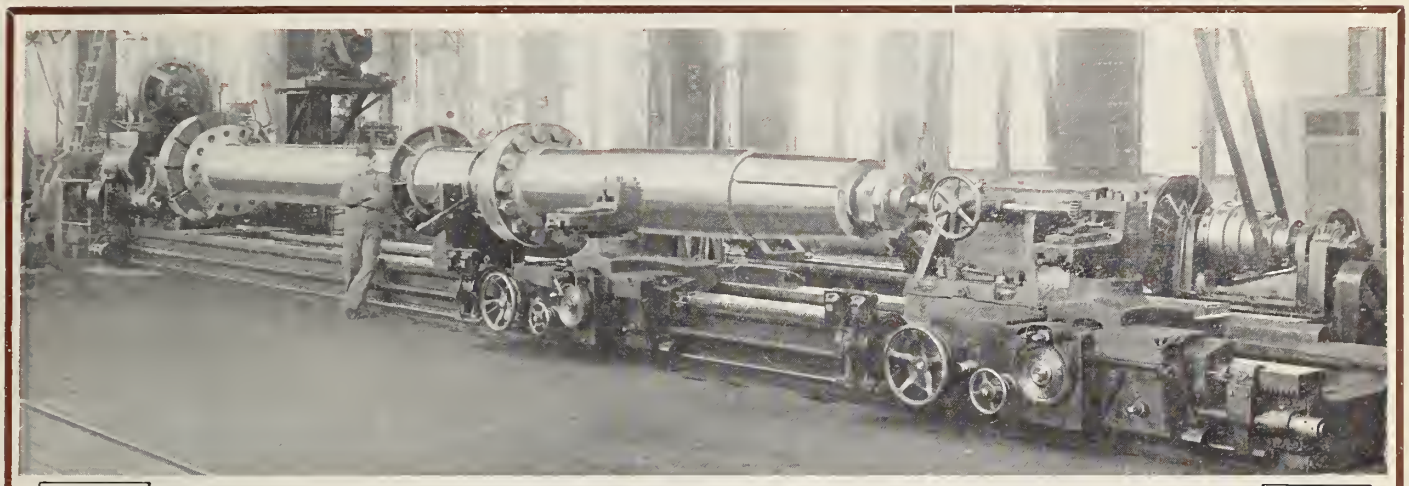
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TORONTO Canada


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Vol. XXXII No. 13 Toronto, July 1, 1923

Electrical Engineering Contracting News Merchandising Transportation



STURDINESS
COUNTS FOR 365-DAY OPERATION

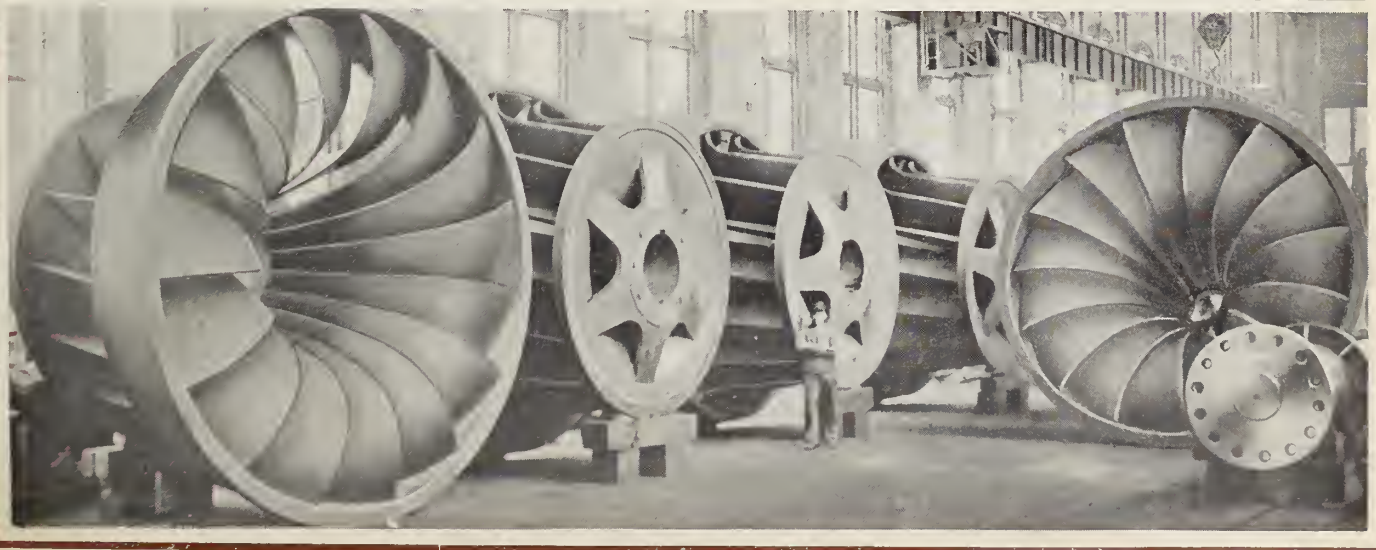
High Efficiency Is Important—
Good Regulation Is Important—
Accessibility Is Important—

BUT REVENUE DEPENDS ON ABILITY TO STAY "ON THE JOB"

Shop Facilities Second to None

S. MORGAN SMITH COMPANY
YORK, PA.

Boston Chicago - San Francisco - Montreal



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Quality Electrical Merchandise

Hotpoint ELECTRICAL APPLIANCES

S SHAWMUT FUSES

CANADIAN BEAUTY ELECTRICAL APPLIANCES

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The Peirce Pole Line Hardware Specialties

BRYANT SUPERIOR WIRING DEVICES

T&B CONDUIT FITTINGS

WIRES & CABLES
Northern Electric Company LIMITED
FIRE ALARMS TELEPHONES SUPPLIES
EDMONTON CALGARY REGINA WINNIPEG TORONTO HAMILTON LONDON OTTAWA MONTREAL QUEBEC HALIFAX

Banfield WIRING DEVICES

D SQUARED SAFETY SWITCHES

AMERICAN VULCANIZED FIBRE CO. WILMINGTON De. U.S.A.
SHEET FIBRE RODS AND TUBES

RIGID IRON & FLEXIBLE CONDUITS

1872 EDWARDS ELECTRIC SIGNALING APPARATUS

"THE BEST THAT" TRADE MARKS MONEY CAN BUY ELECTRIC SIGNAL APPARATUS

BENJAMIN PRODUCTS WIRING DEVICES

TRADE FRANKLIN MARK WIRING DEVICES

HUBBELL WIRING DEVICES

EVEREADY FLASHLIGHTS

Gurney ELECTRIC RANGE

IT gives us genuine satisfaction to ally our own trade-mark with those of the well-known companies here represented.

Each trade-mark stands for a quality product that has long since established its worth wherever electrical work is done.

Complete stocks are carried at our Branch Houses

Northern Electric Company LIMITED

MONTREAL TORONTO WINDSOR CALGARY
HALIFAX HAMILTON WINNIPEG EDMONTON
QUEBEC LONDON REGINA VANCOUVER

"Makers of the Nation's Telephones"

MANUFACTURING
Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and receiving Equipment

DISTRIBUTING
Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

Secure Correct Illumination the



Seamless Deep Bowl Reflector Socket

BENJAMIN

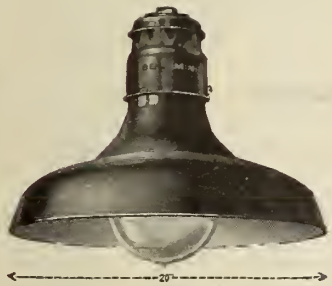
— Way—

Combining Safety with Proper Light Distribution

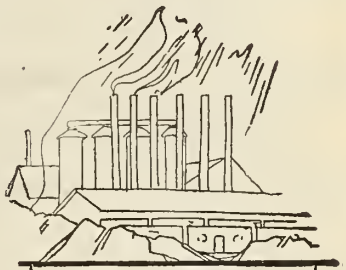


For every condition under which the activities of industry may be correctly illuminated, there is a type of Benjamin Reflector designed and made to suit that condition—the line is complete.

Each Benjamin Reflector is designed with a specialized knowledge of the degree of illumination required in conjunction with the placing of the light sources.



You can get any details you want by just dropping us a card We are ready to help solve your problems whereby better illumination, economy, safety, and higher efficiency are secured in the fullest sense.



Very Informing Literature Mailed on Request

BENJAMIN PRODUCTS

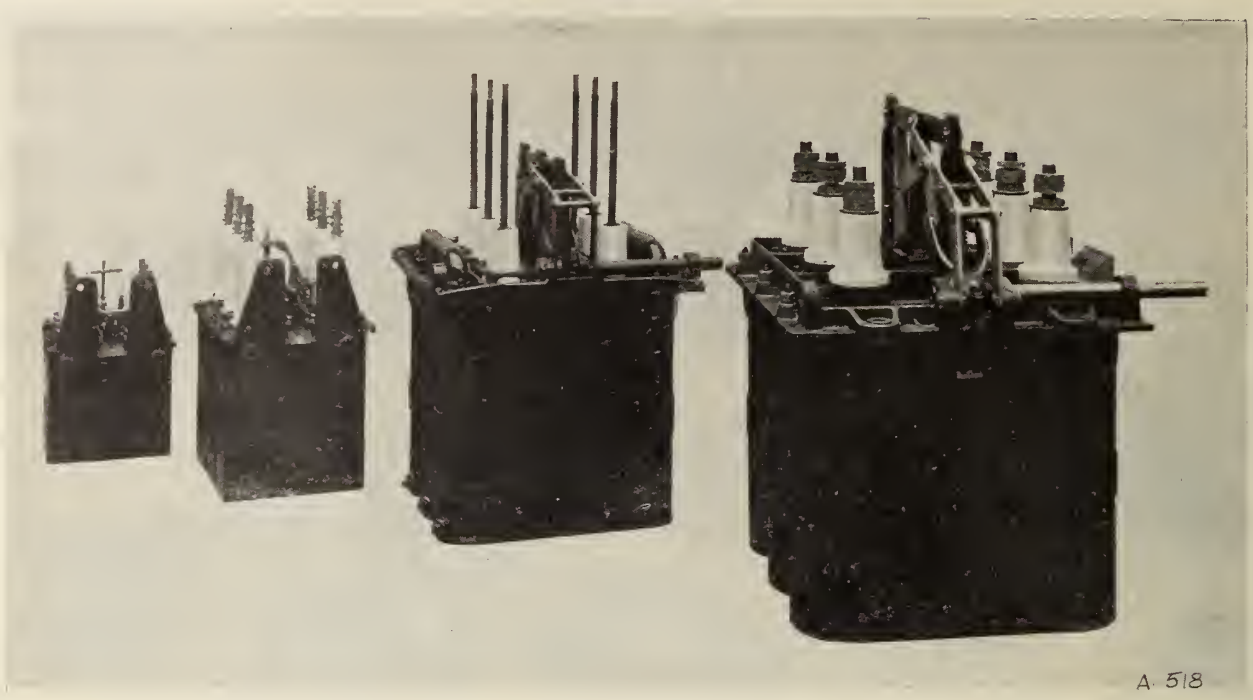
The following are divisions of Benjamin products on which we will be glad to send information:

- Industrial Lighting Division
- Electrical Division (including Benjamin Two-Way Plug)
- Pressed Steel Products Division
- Enameled Products Division
- Starrett Panel Board Division

Benjamin Electric Mfg. Co.

of Canada

Montreal TORONTO Winnipeg



Medium Duty

OIL CIRCUIT BREAKERS

All Sizes

Wherever an important installation is being planned, these reliable English Circuit Breakers should be given consideration.

Full information will be promptly forwarded upon request.

Other Ferguson Pailin equipment includes:

Heavy Duty Disconnecting Switches and Bus Bar Supports; Truck Type Switchboards and Truck Type Breakers; Current Transformers; Outdoor Disconnecting Switches and Bus Bar Supports; Outdoor Weatherproof and Ventilated Sheet Steel Housings; Indoor Interlocked and non-Interlocked Sheet Steel Factory assembled Switchboards; Ironclad Interlocked mining and industrial equipment.

FERGUSON, PAILIN LIMITED

OF CANADA

321 King St. East - Toronto

Works Hr. Openshaw, Manchester, England and Sydney, Australia

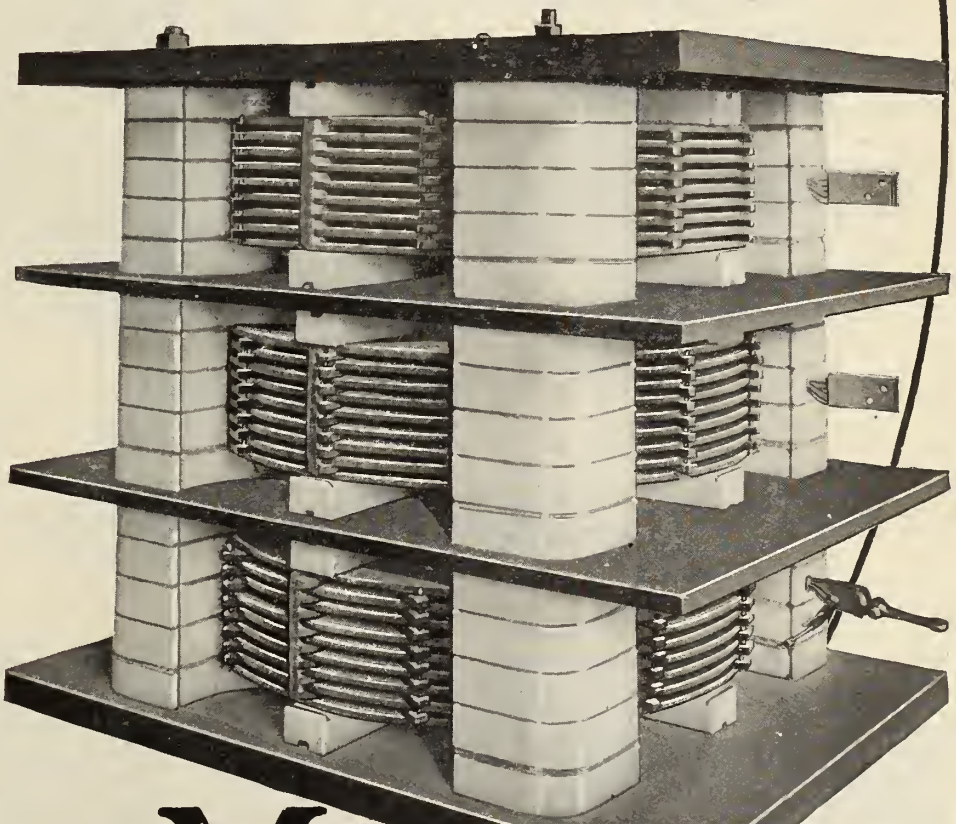
Herman K. Ansingh, Canadian Manage

EBONY ASBESTOS WOOD—not only for switchboards but wherever the highest grade insulating base is demanded

Ebony Asbestos Wood achieved its first reputation as the "no compromise" switchboard material, because it possesses every essential characteristic that a good switchboard must have.

Alert engineers quickly perceived its value in other fields—on high tension work because of its marvelous electrical strength; on severe service because of its rugged durability; on complex installations because it is easily worked, and on "pretty" jobs because of its fine appearance.

CANADIAN JOHNS-MANVILLE CO. LIMITED
Toronto Montreal Winnipeg Vancouver Ottawa



Johns-Manville Ebony Asbestos Wood used as an insulator in 138-133½ K. V. A., 350 Amp., 11000 V., 3 phase Unit Type Reactance Coils.

New York Edison Company, Waterside Station, New York City.

Through—
Electrical Materials
FOR
Utilities
Jobber
Contractor
AND
Dealer

JOHNS-MANVILLE

Cased Glass Lighting Units

We have recently perfected a new cased-glass for Commercial Lighting Units.

The experiments have been made to produce a glass which would give the highest efficiency and pure white rays, which is the new demand for Commercial Lighting.

We have succeeded in combining these two features in our new cased-glass.



Where the highest efficiency and color of light are required, this cased-glass will meet all requirements.

The following units are now made in cased-glass. No's. 396, 397, 398, 399, 515, 516, 517 and 555, 556, 557, 1060, 1061, 1062 and 1063.

Prices and full particulars will be forwarded on application.

Tested and Approved for Use with Nitrogen Lamps.

FACTORY & HEAD OFFICE
388 CARLAW AVE
TORONTO

DOWN-TOWN SHOW ROOMS
164 BAY ST. TORONTO

Jefferson Glass
MADE IN CANADA
COMPANY LIMITED

285 BEAVER HALL HILL
MONTREAL
272 MAIN STREET
WINNIPEG
510 HASTINGS ST. W.
VANCOUVER

"Notice the Lighting Equipment"
"Everywhere you go"

It pays to use equipment you can depend on

—for instance these Banfield Surface Switches



2753

Eighteen different styles on two sizes of bases. From 3 Ampere—125 Volt to 10 Ampere—250 Volt.



2763



2602

Brass or composition covers, composition or porcelain handles. Covers and handles are **interchangeable.**



2606



2608

Quick to wire, because wire finds its place automatically and does not have to be looped to go under screw head Absolute contact assured.



2900



Made (not assembled) by Banfield's in Canada yet equal in price, quality and efficiency to the best imported switches.



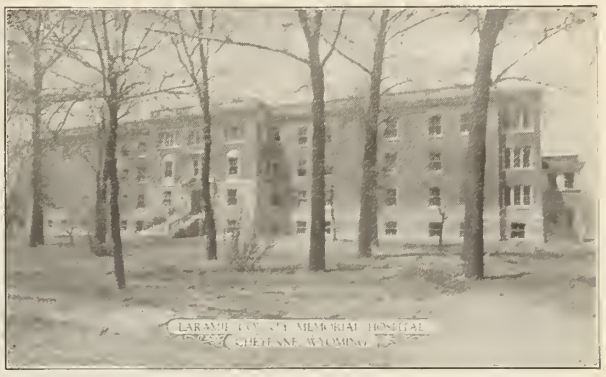
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Baerresen and Porter, Cheyenne, Wyo. Architects.
Cheyenne Construction Co., Electrical Contractors.

Holtzer-Cabot

Hospital Signal Systems

Laramie Co., Memorial Hospital at Cheyenne, Wyo., is another of the great many modern hospitals, Holtzer-Cabot equipped.

Fifty years leadership in the manufacture and development of Hospital Signal Systems is a protection that the Architect, Engineer, the hospital management and its working staff should not overlook.

This is why an ever increasing number of the leading Architects and Engineers are specifying Holtzer-Cabot Systems exclusively.

Architects, engineers and members of building boards are invited to write for two brochures entitled "Signal Systems for Hospitals" and "Signal Systems for Schools."

Our engineers are at the service of architects and their clients at all times, just call on our nearest office.

The Holtzer-Cabot Electric Co.

Electrical Signaling Systems

Home Office and Factory

125 Amory Street, Boston, Mass.

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Rubber Covered Wires and Cables

FOR POWER, LIGHT AND TELEPHONE WORK

Incandescent Lamp Cord, Flexible Switchboard Cables, Special Cords and Cables for all kinds of Electrical Work.

Prompt Shipments from Canadian Factory.

BOSTON INSULATED WIRE & CABLE CO., Limited

Canadian Office and Factory, HAMILTON, ONT.

GALVADUCT



LORICATED

A Galvaduct Building
Physicians and Surgeons Building, Toronto

"GALVADUCT"

The most perfect interior construction conduit on the market.

Recognized as the standard of high quality.

Always specify Galvaduct or Loricated CONDUITS.

"LORICATED"

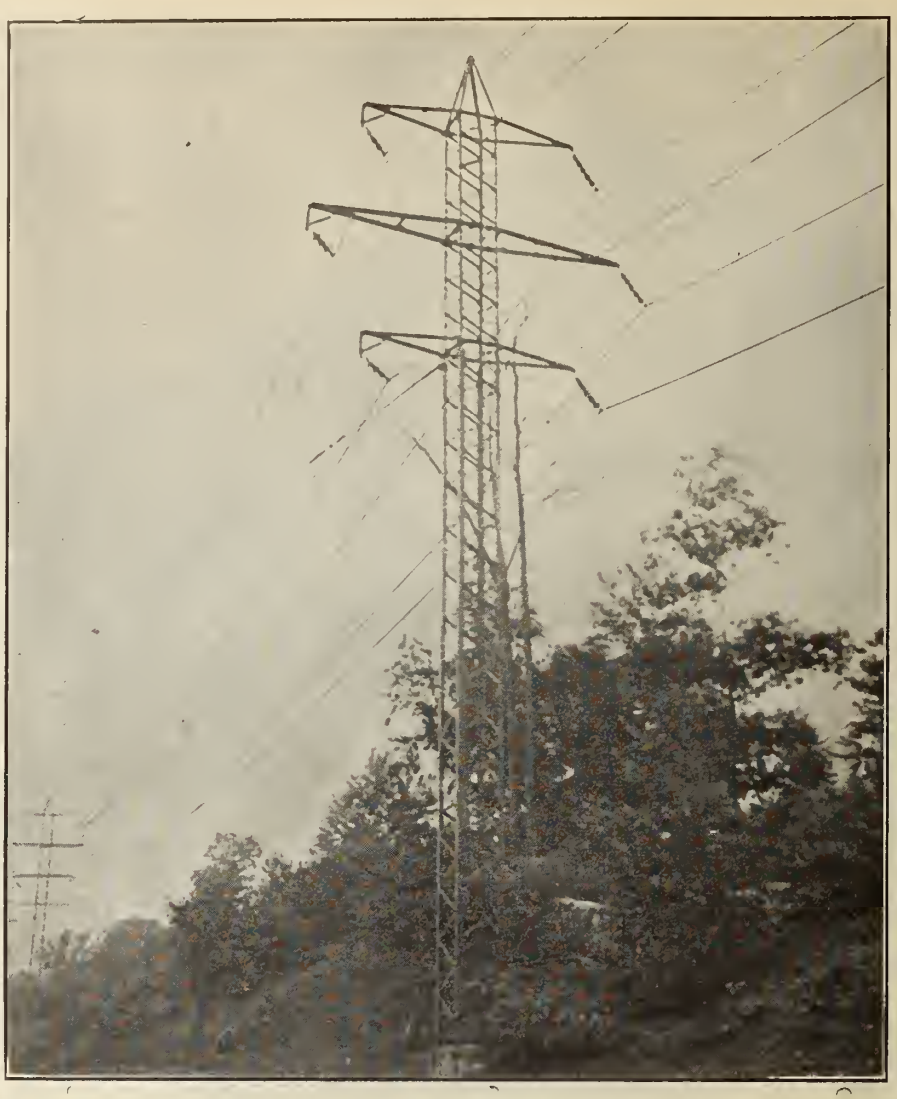
A high-class interior construction conduit of the enameled type, proof against acid or other corrosive agents.

If your jobber cannot supply you—write us.

CONDUITS COMPANY LIMITED

Head Office and Factory—Toronto

Western Sales Offices: Winnipeg and Vancouver



YONKERS ELECTRIC LIGHT & POWER COMPANY
Line from Croton Dam to Elmsford, N.Y.
3/0 Aluminum Cable Steel Reinforced. Erected in 1916.

Electrical Developments in the Metropolitan District surrounding New York City was investigated with interest by thousands of visitors during the recent convention of the National Electric Light Association.

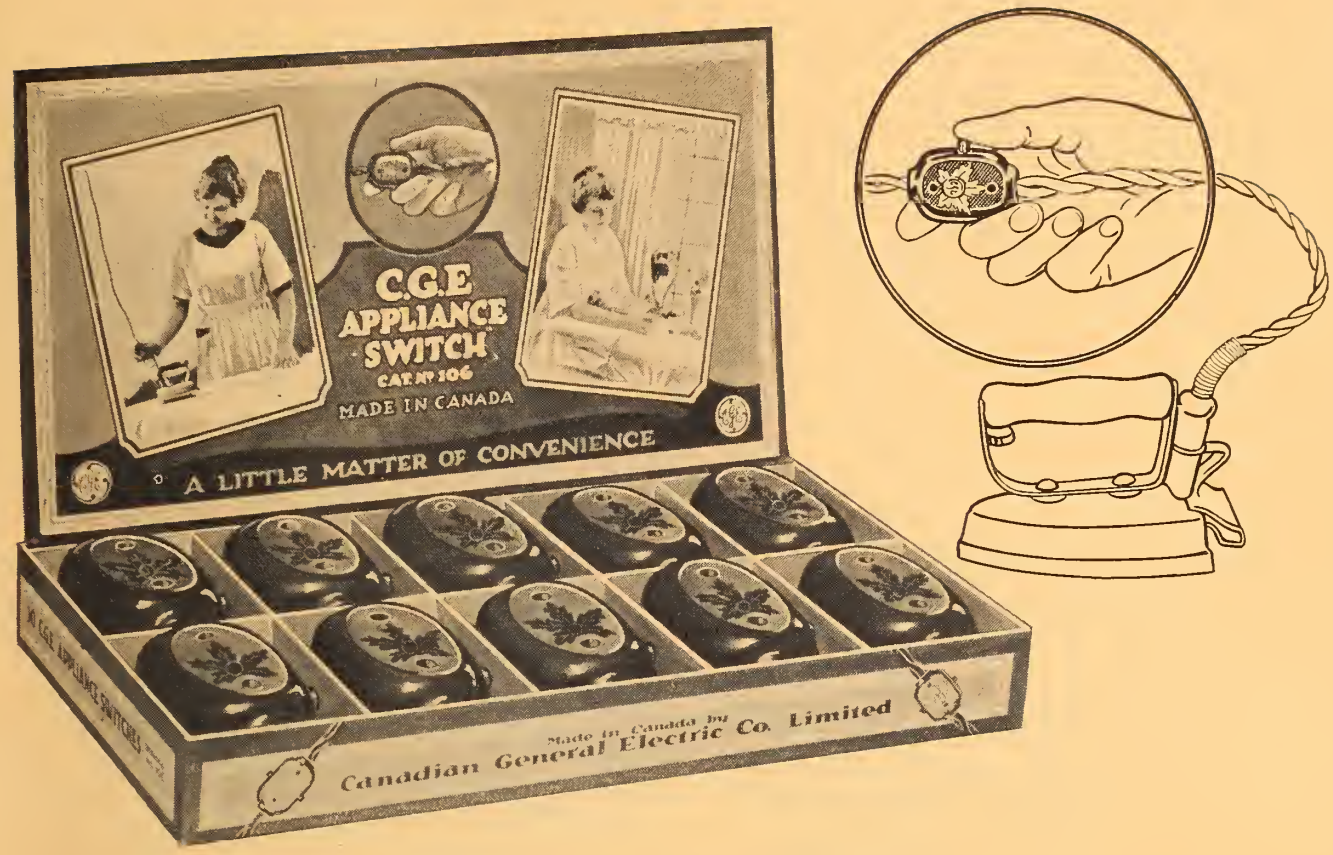
In such a district, reliability is the keynote for equipment and materials.

Aluminum Cable, Steel Reinforced

combines the desirable qualities of High Strength, Light Weight, and Long Life.

NORTHERN ALUMINUM COMPANY, LTD.

1307-09 BANK OF HAMILTON BUILDING
TORONTO, ONT.



"A Little Matter of Convenience"

The New C. G. E. Appliance Switch

CAT. NO. 106

Thousands of electric irons, toasters, percolators and other appliances in daily use offer a wonderful market for this convenient little switch.

It is packed in a very attractive merchandising container—suitable for counter display. A show card attached to the carton illustrates in a striking manner the convenience of having all heating goods equipped with these switches.

After selling an iron, toaster or percolator, it is a very simple matter to draw your customer's attention to the display carton on the counter, and to suggest that you attach one of the switches to the new appliance, the result being two sales instead of one. The door is then open for still further sales, as the customer will be in a receptive mood towards having other appliances similarly equipped.



Acorn Pendent Switch
Cat. No. C.G.E. 306



Porcelain Pendent Switch
Cat. No. C.G.E. 206

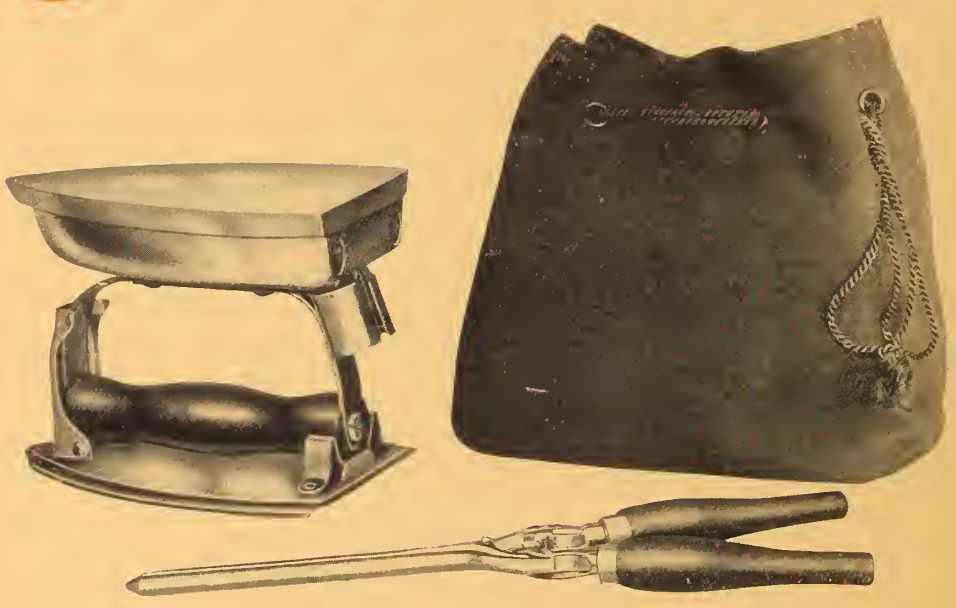
"Made in Canada" by

Canadian General Electric Co., Limited

HEAD OFFICE TORONTO

Branch Offices: Halifax, Sydney, St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

Hotpoint



Boudoir Set



THIS season of the year, travelling is much indulged in and for that reason, Hotpoint Boudoir Sets, three pound irons, curling irons, etc., find a ready market.

The Boudoir Set, illustrated above, consists of a three pound iron and a metal stand for converting the iron into a small stove, and a pair of folding curling tongs. There are two holes in the base of the iron for the purpose of inserting the tongs.

The Boudoir Set makes an extremely convenient travelling accessory, as it takes up very little space.

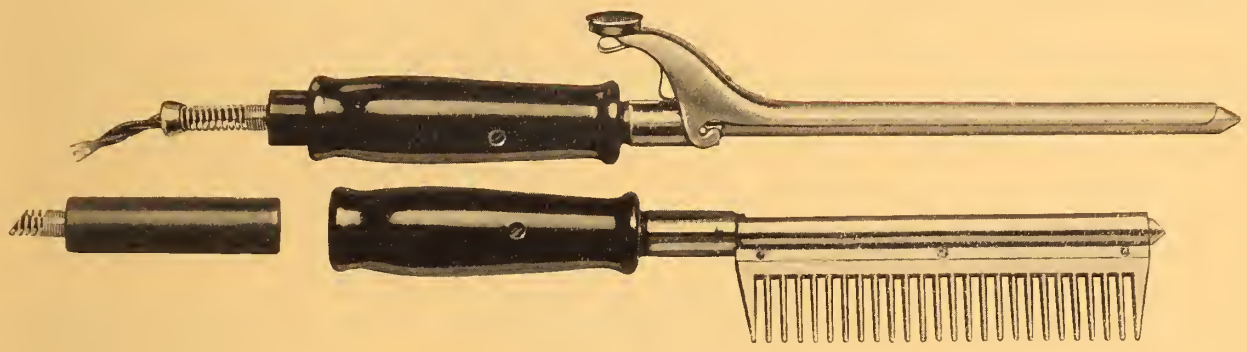
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HOTPOINT DIVISION

of

Canadian General Electric Co., Limited

Hotpoint



Curling Iron

THIS well-nigh indispensable device, for milady's dressing table, is finished in nickel-plate with ebonized handles.

The separable swivel plug allows perfect freedom in the use of the iron, eliminating all danger of the cord becoming twisted and breaking at the terminals.

The element heats very quickly, but at no time will the waver rod become overheated. The shield is readily removable, so that the waver rod many be used alone. A comb made with aluminum teeth can also be supplied for use in drying the hair.



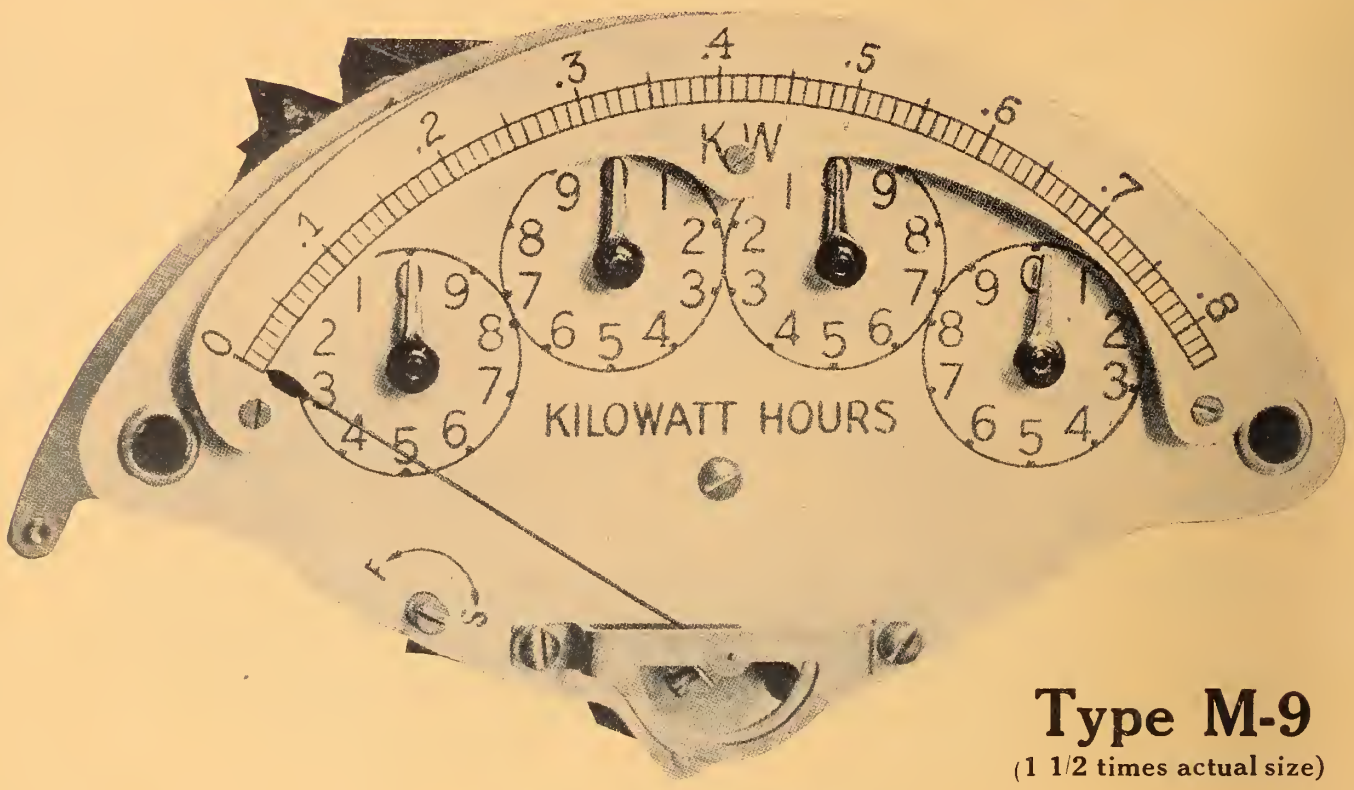
"Made in Canada" by

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited

A New Demand Meter Register



Type M-9
(1 1/2 times actual size)

THE Canadian General Electric Company Limited, announces the new M-9 Demand Meter Register superseding the M-7 and incorporating several marked improvements.

The M-9 is a demand meter embodied in the register of the I-14 single-phase or D-6 polyphase Watthour Meters. It is furnished as a combined device with the watthour meter, or separately for installation in meters now in service.

The new register is very simple in its mechanical design and possesses the following prominent features:

- Instantaneous and positive reset.
- Long scale.
- Improved timing motor with greater torque and power.
- Light-weight rotor in motor.
- Micrometer adjustment of timing motor speed.
- Micrometer zero adjustment for demand pointer.
- Provision for quickly returning watthour pointers to zero.

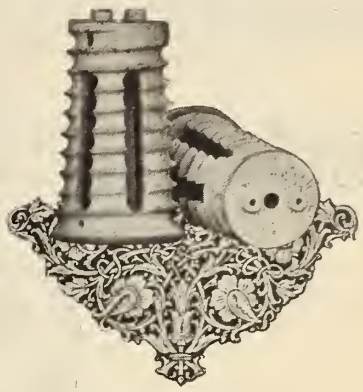
As a leader and pioneer in the art of meter and instrument building the Canadian General Electric Company offers one of its latest developments in this line. The C.G.E. Office in your locality will furnish additional information on request.

Canadian General Electric Co., Limited

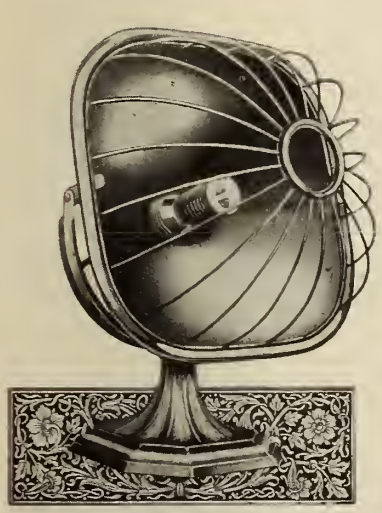
HEAD OFFICE TORONTO

Branch Offices: Halifax, Sydney, St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

L&H REFLECTOR HEATERS use ELEMITE



DOUBTLESS the outstanding reason for the marked success of the L & H Reflector Heater is its dependable heating element. The reputation of A. J. Lindeman & Hoverson Co. of Milwaukee, prominent manufacturers of Stoves, Ranges and Sheet Metal Ware since 1890, demands "quality materials" throughout. Significant verification of the rigid R & L policy will be found in the fact that heating units of all R & L Reflector Heaters are based on ELEMITE porcelain cores



ELEMITE FOR LONG SERVICE

ELEMITE is the one dependable porcelain structure suitable for use in the heating element of Quality electrical appliances. It is Flexible. Will expand and contract with temperature changes, without cracking. Will pass the most severe temperature test ever imposed on porcelain. Elemite is produced in special shapes to the exact specification of customer.

Send sketch or model for cost estimates.
Write for samples for testing

THE LOUTHAN MANUFACTURING CO.
EAST LIVERPOOL, OHIO
FACTORIES
EAST LIVERPOOL, O. LAUGHLIN, O.



Write for bulletins. They should be in your files.

MOLONEY

The "service" advantages to be gained from the use of Moloney transformers far outweigh the "price" advantage of cheaper equipment. Moloney transformers are made up to a standard, not down to a price. Only the most suitable materials and the highest skilled workmanship are used—and this, together with their acknowledged leadership in design, forms the real reason for their advancing popularity.

A Truly Canadian-Made Product

MOLONEY ELECTRIC COMPANY OF CANADA, LTD.
Factory and Head Office: 213-219 Sterling Rd., Toronto, Ont.
Branch Offices: Montreal, Halifax, Winnipeg
Agents: General Supplies Co., Calgary, Alta. Frank Darling, Vancouver and Victoria, B.C.

·SEPCO·

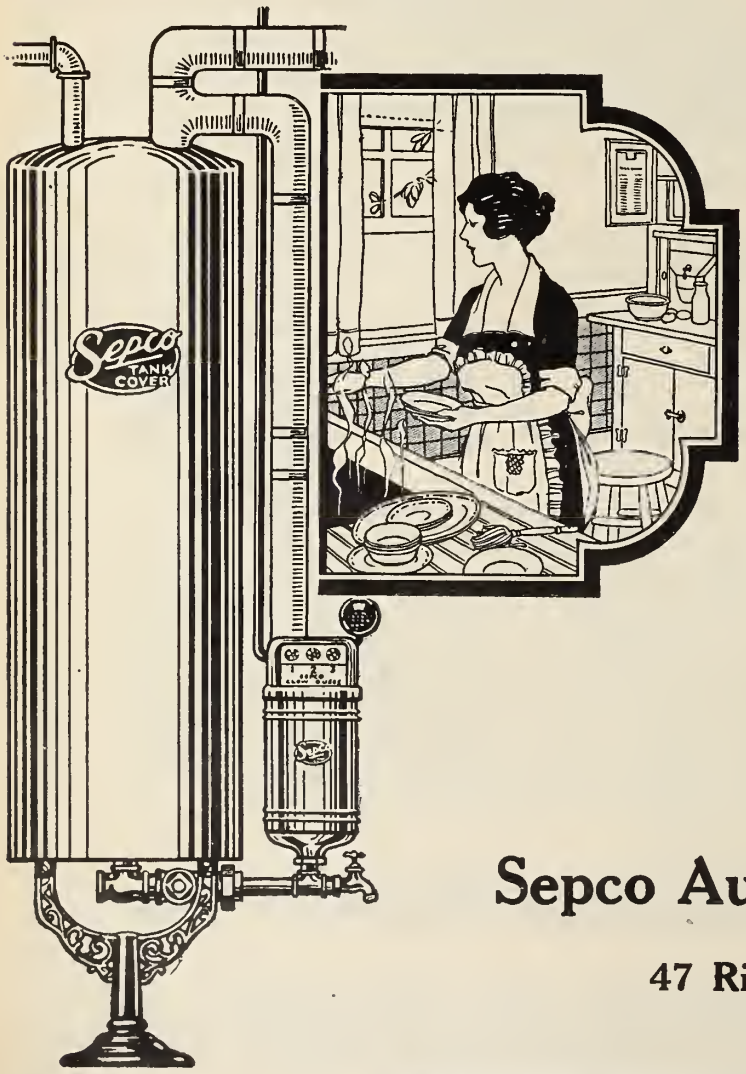
Electrical Dealers —

Have you made application for the AGENCY yet?

Sepco AUTOMATIC ELECTRIC

THIRTY-DAY FREE TRIAL OFFER

We are willing to place a Sepco heater in a home of your own selection—or your own home if you desire—for a thirty day trial. If after this test you are not thoroughly sold on what this heater will do, return it and you will not be obligated in any way.



For years, SEPCO engineers have been experimenting in an effort to produce a simple —practical—efficient—yet absolutely reliable and economical method of heating water electrically.

Now—SEPCO engineers have triumphed, and we are manufacturing today in our American and Canadian plants, a marvellous automatic electric water heater that is truly the sensation of the year.

Already thousands of SEPCOS have been sold and already thousands of delighted users all over the country are loud in their praise of SEPCO efficiency.

Just as electricity has superseded gas for lighting purposes—so will the SEPCO supersede gas for the purpose of heating water. Read about our free trial offer above. It will convince you of our faith in SEPCO heating.

Take advantage of the FREE TRIAL offer

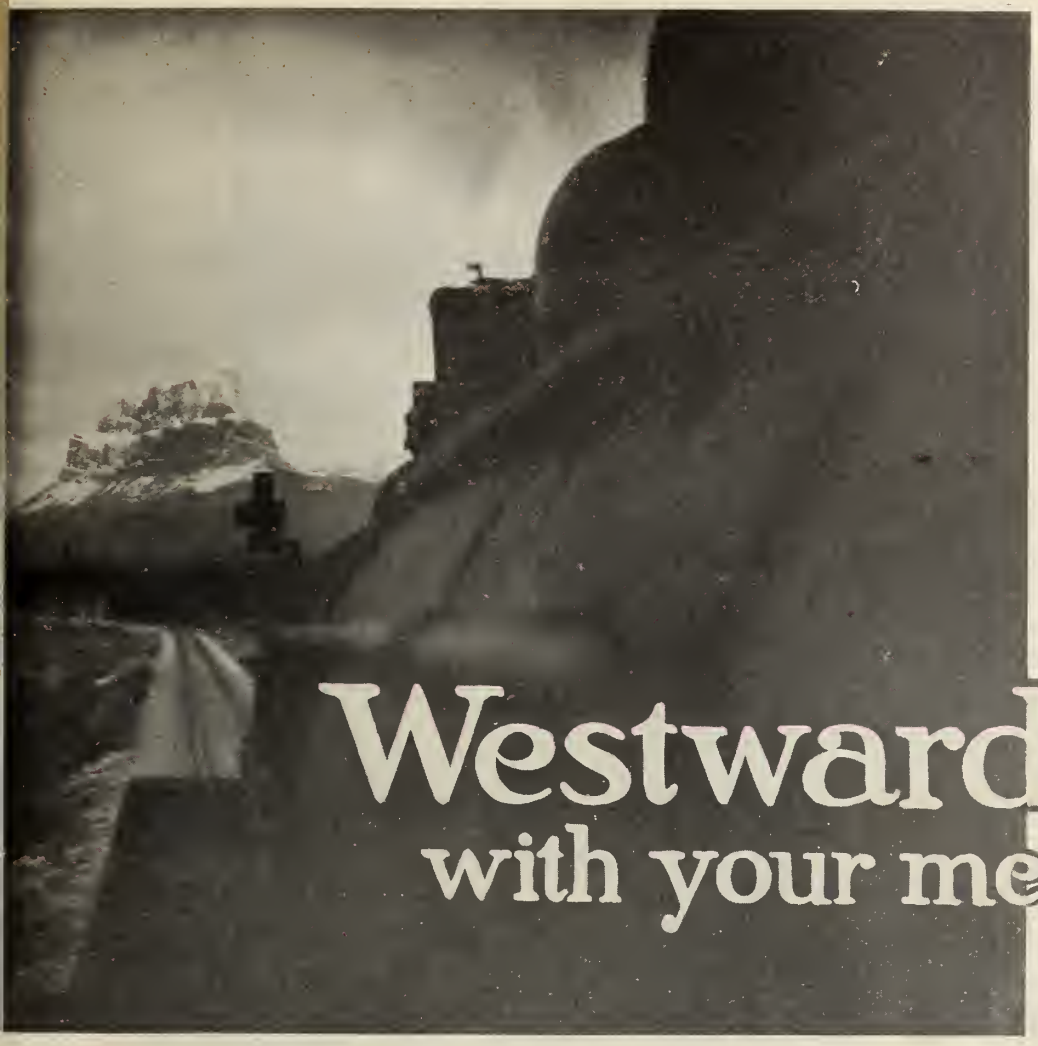
Practically all of our agency connections have been made in this way, which proves we have a product of unusual merit. Drop us a line NOW for full details.

Sepco Automatic Electric Heaters

LIMITED

47 Richmond St. E. Toronto, Ont.

·SEPCO·



Photograph of Castle Mountain in the Canadian Rockies from the engine cab, by staff of the

Electrical
Engineering Contracting **News** Merchandising Transportation

For Thirty Years the Leader in the East, the Prairies and the Coast.

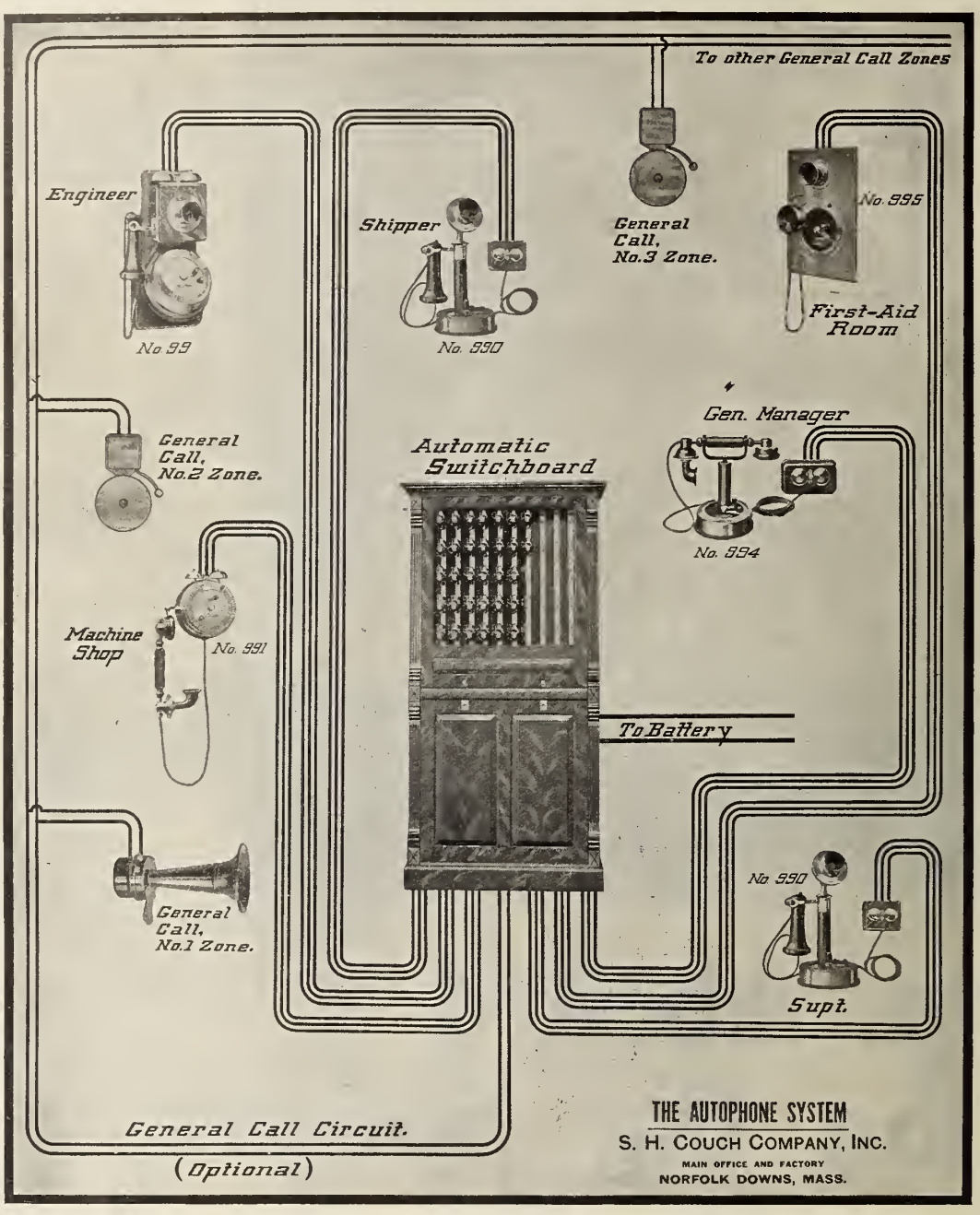
Jump Aboard the Big Special for the Pacific!

STARTING July 15th, thirty-five hundred copies of the "Electrical News" will be on the road for our advertisers—calling especially on the electrical dealers, central station owners and operators in the beautiful province of British Columbia.

Do Not Fail To Take This Business Trip!

Write us at once to make your reservations for advertising space in this great British Columbia Number of "Electrical News."

349 Adelaide St. West, Toronto



Couch Automatic Telephone System

Instantaneous Operation—Any station can call any other non-busy station instantly hy merely operating a dial once. No central operator required.
Secrecy of Conversation—Access to an engaged line is prevented. Calling party gets busy signal.
100% Capacity of Conversations—Any station may connect to any other non-busy station regardless of the number of lines already in use.
Conference Service—Several stations may interconnect for private conference and several such conferences may be established at one time.
General Call Service—Horns or special tone bells operative from any Autophone station (or confined to a few if preferred) to signal an executive temporarily absent from his usual station.
Continuity of Service—Service is available at all times day and night, for the day force,, overtime force, night force or night watchman.

Bulletin No. 72 gladly sent on request.

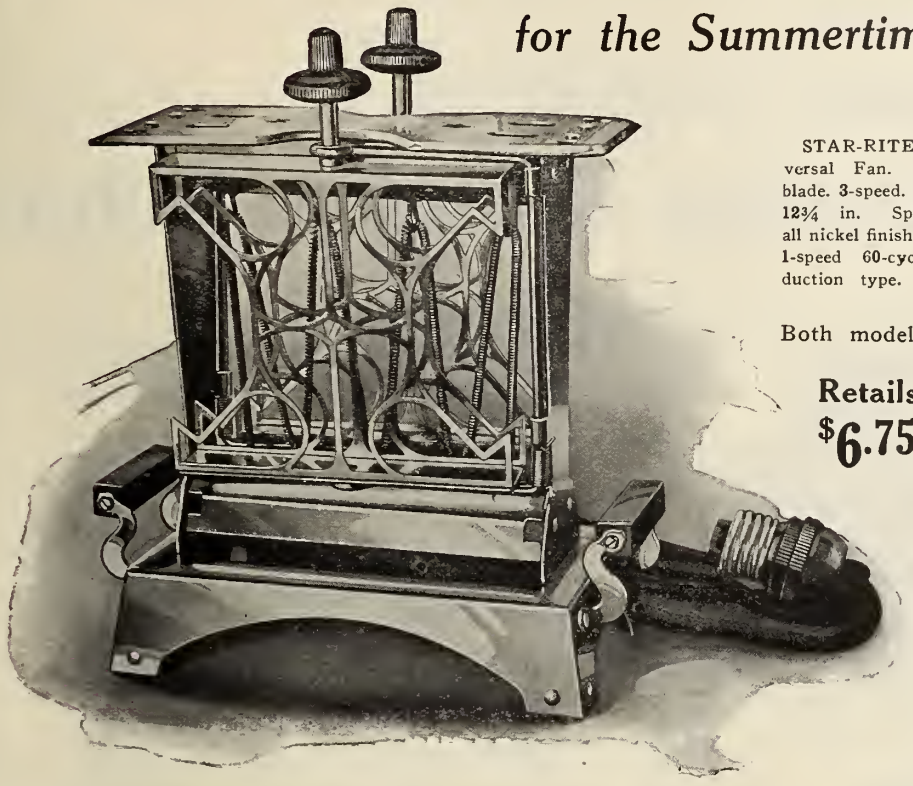
G. L. MacGillivray & Company Limited

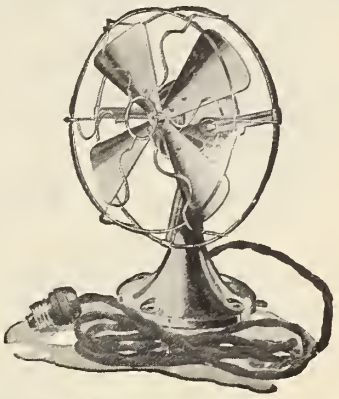
3 St. Nicholas Street, Montreal

Ontario Representative: A. R. Wooldridge, 220 King St. West, Toronto

Two STAR-Rite Winners

for the Summertime





STAR-RITE Universal Fan. 8-inch blade. 3-speed. Height 12¾ in. Sparkling all nickel finish. Also 1-speed 60-cycle induction type.

Both models retail at **$13.50**

Retails $6.75

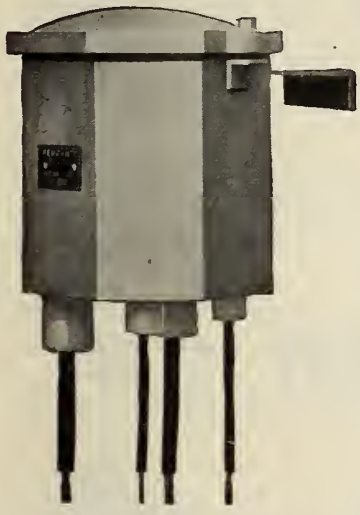
Remarkable toaster value. The New STAR-RITE Toaster stands 9½ in. high, is finished in sparkling nickel and has two non-hot ebonized handles. The most beautiful and most practical toaster made. Note the two black turn knobs and the new improved way of turning toast.

The Canadian Fitzgerald Mfg. Co.
95 King Street East, Toronto

From Your Jobber

STAR-Rite
ELECTRICAL NECESSITIES

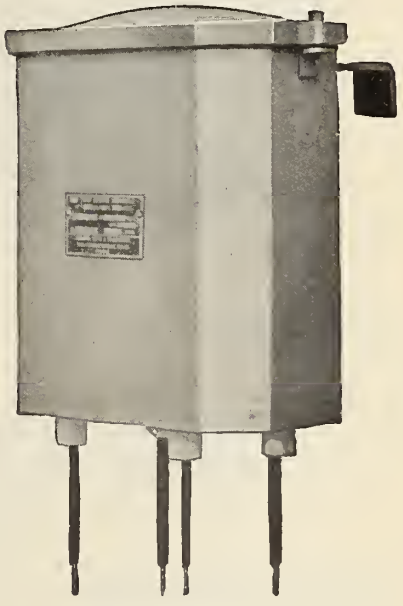
FERRANTI
Transformers
Current and Potential for Rural Distribution



Type "GW"

TYPE "GW" Cross-Arm Mounting Weatherproof. Circuit up to 6600 volts. Rating 50 Volt Amperes.

TYPE "PW" Potential Transformer, Pole Mounting Weatherproof, Single, or Three Phase for circuits up to 6600 Volts.

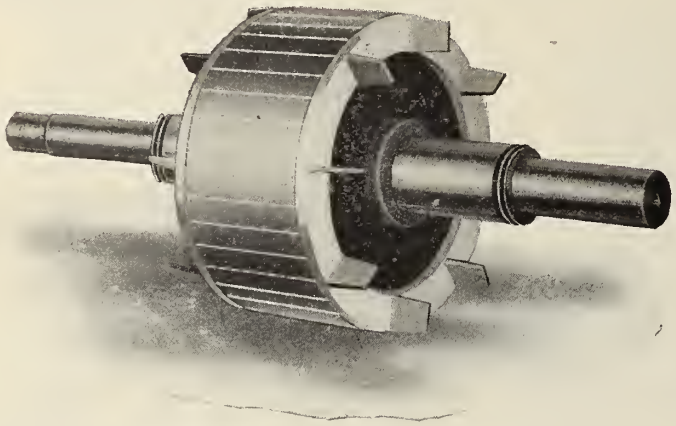


Type "PW"

Ferranti Meter & Transformer Mfg. Co. Ltd.

26 Noble St. TORONTO | 128 Bleury St. MONTREAL | Cox Bldg., HALIFAX | 145 Market Ave. WINNIPEG | Northern Ontaric J. P. Bartleman TIMMINS | Northwestern Engineering & Supply Co. CALGARY

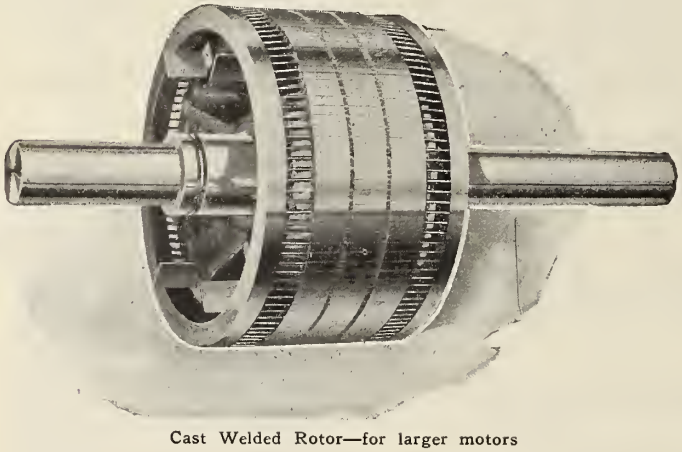
No soldered joints or bolted connections in Canadian Crocker-Wheeler Rotors



Cast Winding Rotor, for smaller motors

Canadian Crocker-Wheeler Cast Winding Squirrel Cage Rotor

In this construction the rotor bars, short circuiting rings and fans are all made of the same material and are cast at one operation. No soldering, no rivets or screws to loosen and come away. There can be no sparking or arcing between bars and rings. Means smoother running and longer life. Used in small motors.



Cast Welded Rotor—for larger motors

Canadian Crocker-Wheeler Cast Welded Squirrel Cage Rotor

A solid short circuiting ring is cast welded to the rotor bars. Each ring is thus positively locked to the bar and becomes solidly welded to it. Failure between the two—which was the great and constant weakness of older designs—is therefore impossible. This design is used in moderate and large size motors.

THE CANADIAN CROCKER-WHEELER CO. LIMITED

Manufacturers and Electrical Engineers

Head Office and Works:
ST. CATHARINES, Ont.

District Offices:
TORONTO MONTREAL

Also all Branches of *Northern Electric Company* LIMITED

Montreal, Halifax, Quebec, Toronto, Hamilton, London, Windsor, Winnipeg, Regina, Calgary, Edmonton, Vancouver.

"Reel Service"

From Coast to Coast

Canada Wire & Cable Co. Limited

Halifax Montreal Toronto Regina
Winnipeg Calgary Vancouver

MANUFACTURERS OF
Copper
Bare, Weatherproof, Rubber Covered

Electrical Wires and Cables

and STEEL WIRE ROPE



An Electric Safety Valve

The U-RE-LITE combines absolute protection for the circuit with complete safety for the operator, and by its use, real savings in time, money and labor are secured.

Once installed the U-RE-LITE is always ready for service and requires no re-loading or renewal parts.

The CUTTER COMPANY
ESTABLISHED 1888 PHILADELPHIA
24 Adelaide St., E., TORONTO

Interior Telephones

for

Apartment House, Factory, School, Hospital, Office

Electric Reset Annunciators and Signal Specialties

Hospital Signal System

A complete new silent call system for hospitals. Registers at nurses' quarters and office with time record, if wanted.

Canadian Factory Representatives:

Cochrane, Stephenson & Co. Ltd.
850 Hastings St.
Winnipeg, Man.

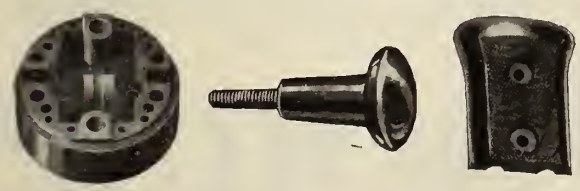
Cochrane, Stephenson & Co. Ltd.,
901 Credit Foncier Bldg.,
Vancouver, B.C.

Timberlake & Bourne
New Birks Bldg.,
Montreal, Quebec

The Pierce Electric Company,
104 Richmond St. West,
Toronto, Ontario

CONNECTICUT TELEPHONE & ELECTRIC COMPANY
MERIDEN CONNECTICUT

Cold Molded Insulating Part



AMERICAN INSULATOR CORPORATION
New Freedom, Pa., U.S.A.
Represented in Canada by
G. L. MacGILLIVRAY & CO., LIMITED
3 St. Nicholas St., Montreal, P.Q.

MICA

KENT BROTHERS
Kingston, Ont., Canada

Miners, Exporters and Dealers in Canadian Amber Mica.
Thumb Trimmed, Cut to Size, Splittings, Discs, Washers, Etc.

Write us for prices and let us figure on your requirements.



TYPE W WESTINGHOUSE RANGE

Never before have dealers had the opportunity to display an electric range embodying so many attractive selling points as the new TYPE W. WESTINGHOUSE.

Its mechanical perfection and beauty of design will make many quick and profitable sales.

For appearance alone this range is truly in a class by itself and will attract many customers, while those who desire a mechanical demonstration will readily appreciate the many exclusive Westinghouse features.

Some of the Features:

Seamless Porcelain enamel lined oven with all parts removable.
Top heater units removable without disconnecting any wires.
Fuses readily accessible.
Switches rotate in either direction.
Solid bus bar construction.
Two heating areas on top heater units.

Made in CANADIAN WESTINGHOUSE ***Canada***

Canadian Westinghouse Co., Limited, Hamilton, Ontario

District Offices:

Toronto Montreal Winnipeg Calgary Vancouver
Edmonton Fort William Ottawa Halifax

Westinghouse

TYPE W RANGE

$1,000 Free



Not Exactly a Gift—But we will show you How to get it

—Read this—

Assume that your volume of Business is only $20,000 per year. We will guarantee that by using the Henderson Pricing System you will obtain an extra 5% on this volume which amounts to an extra $1,000 clear profit. This can be accomplished without losing trade and with an extra added expense of only $3.00 per month or .10 cents per day (the cost of the Service).

Henderson Business Service supplies you with the correct selling prices on over 2000 items from a ⅛" socket to 500 thousand C.M. cable. The prices are not guessed at but figured out on a systematic basis, making ample provision for you Overhead Expense and a reasonable profit to which you are entitled.

Price your goods and charge up your jobs from Hendersons Book and show your customers you are operating your business in a busineslike manner. This will instill confidence in their minds and eliminate errors and if complaints should arise in connection with your charges check up with the customer from the book. Practically all the leading Electrical concerns use it.

INVESTIGATE TO-DAY

Henderson Business Service Ltd.

Box 123

Brant Farmers Bldg. Brantford, Ont.

Henderson Business Service Ltd., Box 123, Brantford, Ont.

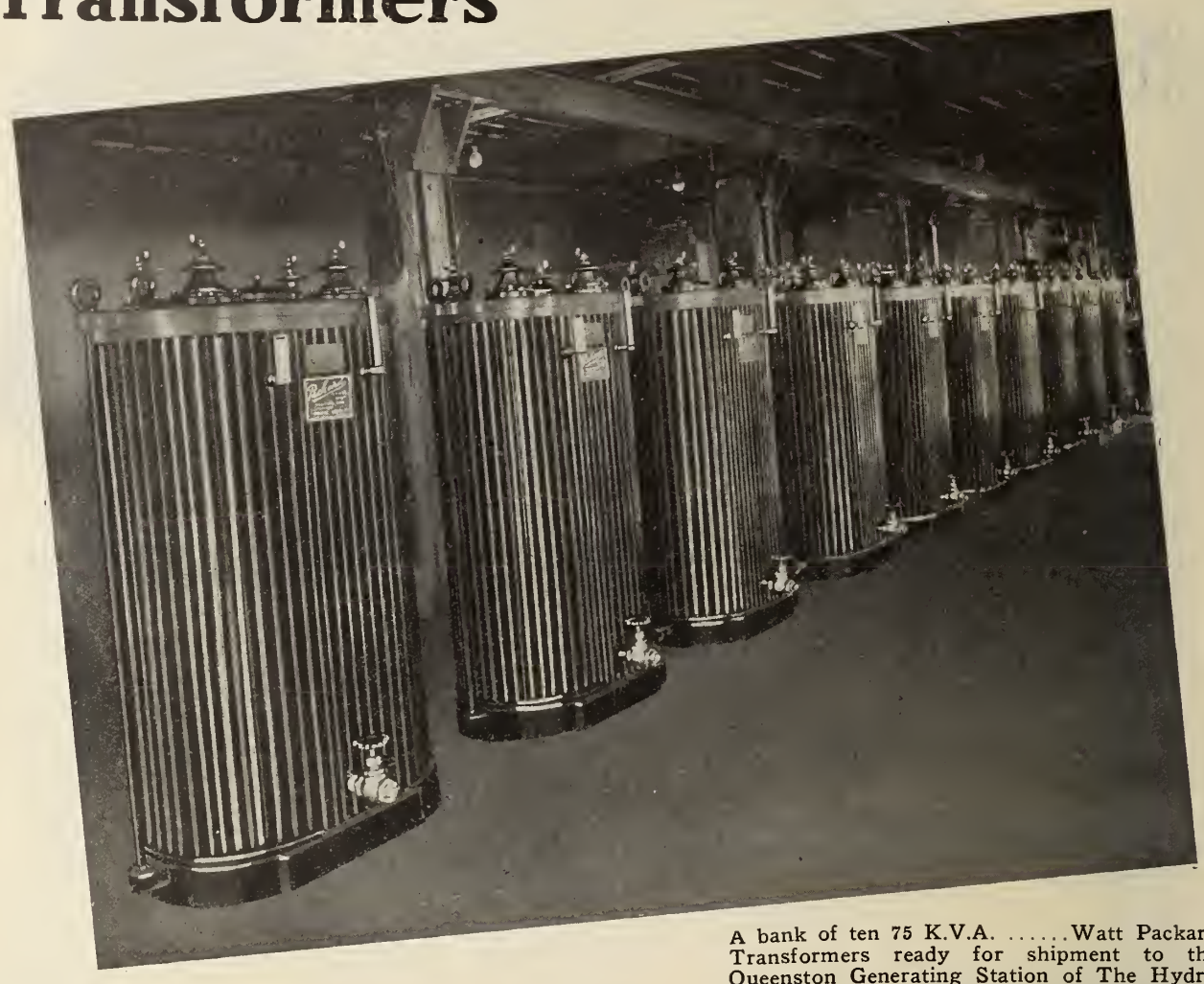
Send us more particulars about your service

Name .....

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The Hydro Commission Chooses Packard Transformers



A bank of ten 75 K.V.A. .....Watt Packard Transformers ready for shipment to the Queenston Generating Station of The Hydro Electric Power Commission of Ontario.

Packard

TRANSFORMERS

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St. Catharines, Ontario

Room 308-9, 7 Adelaide St. W., Toronto — 421 Power Building, Montreal

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Ask your jobber.

N. SLATER COMPANY, Ltd. - Hamilton, Ont.

The Star Porcelain Company

TRENTON, N. J.

Manufacturers of Electrical Porcelain Specialties. Also specialize in the manufacture of heater bricks for electric ranges.

CANADIAN PORCELAIN CO.

LIMITED

HAMILTON - CANADA

Manufacturers of High and Low Tension Porcelain Insulators



Kyle Boring Machine

Bores holes at any angle.
Adjustable 4½ to 13½ feet.
Price $29.00

One Montreal Dealer says:
"Just the machine I wanted."

Another Dealer says:
"Saved the price of two machines on one job."

Distributors wanted.

Ren Automotive Supply Co. Ltd.
Preston, Ontario

International Business Machines Company

LIMITED

300 Campbell Ave., Toronto

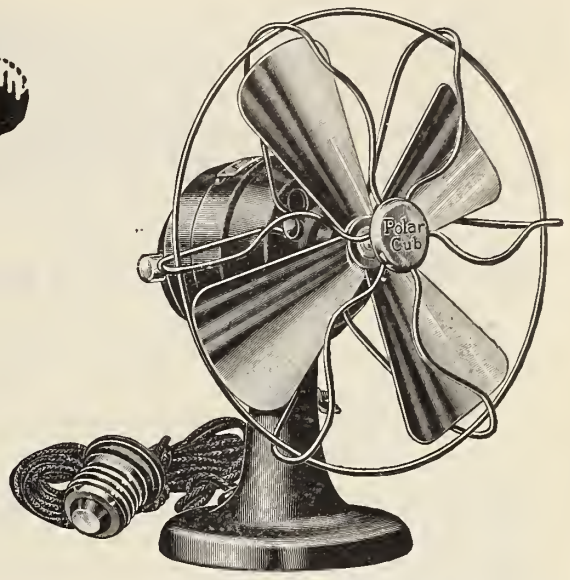
Manufacturers of International Electric Time Systems, comprising Master Clocks, Secondary Wall Clocks, Bell-ringing Programme Devices and Automatic Charging Cabinets.

Complete Electric Time Systems for Schools, Colleges, Public Institutions, Office Buildings, Factories, etc.

Polar Cub
Electric Fan

Model G—6" Black Telephone Fan Retails $7.50.
Model G—8" All Nickel Fan Retails $12.00.

Improved Type of Motor
Brass Blade—New Type Guard
Season's Guarantee



This trio will make for wonderful merchandising if given a display in your store and windows. The advertising will be on a larger scale than ever. Show cards and window display pieces supplied with every carton.

ORDER NOW PLEASE

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Polar Cub Fans — Hair Dryers — Vibrators — Sewing Machine Motors — Radio

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"Direct-Acting Steam Pumps" by Frank F. Nickel. Published in 1915 by McGraw-Hill Book Company. 258 pages illustrated. Price $2.00.

"Electric Railway" by A Morris Buck, M.E. Published in 1915 by McGraw-Hill Book Company, Inc. 390 pages, illustrated. Price $2.50.

"Engineering Electricity" by Ralph G. Hudson, S.B., 190 pages Illustrated. Published in 1920 by the John Wiley & Sons, Incorporated. Price $2.00.

"Handbook of Machine Shop Electricity" by C. E. Clewell. Published in 1916 by McGraw-Hill Book Company. 461 pages, illustrated. Price $2.50.

"Principles of Alternating Current Machinery" by Ralph R. Lawrence. Published in 1916 by McGraw-Hill Book Company. 614 pages, illustrated. Price $3.50.

"Radiodynamics"—The Wireless Control of Torpedoes and Other Mechanisms, by B. F. Miessner. Published in 1916 by D Van Nostrand Company. 206 pages, 112 illustrations. Price. $1.50.

"Telegraph Practice, a Study of Comparative Method" by John Lee, M.A. Pubished in 1917 by Longmans-Greene & Co. 102 pages. Price 75c.

"Telegraphy"—A Detailed Exposition of the Telegraph System of the British Post Office, by T. E. Herbert, A.M. Inst., E.E. Third edition. Published in 1916 by Whittaker & Company. 985 pages, 630 illustrations. Price $1.50.

"Theory and Calculation of Transient Electric Phenomena and Oscillations," by Charles Proteus Steinmetz. Third edition, revised and enlarged. Published in 1920 by McGraw-Hill Book Co., Incorporated. 696 pages, illustrated. Price $6.00.

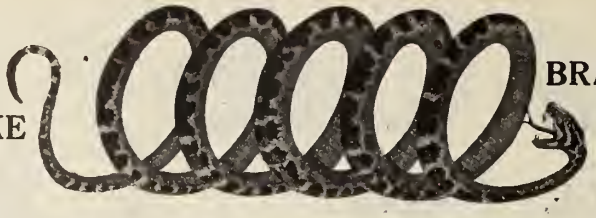
"Testing of Electrical Machinery," for non-electrical students, by J. H. Morecroft. Fourth edition, revised and enlarged. Published by D. Van Nostrand Company, 1921. 220 pages, 111 illustrations. Price $3.00.

"The Dynamo" (2 volume), by Hawkins & Wallis. Published in 1909 by Whittaker & Company. Price $3.00.

"The Essentials of Transformer Practice". A treatment of the theory, design and operation of the transformer from a practical engineering viewpoint, prepared primarily for the engineering student and the designing and operating engineer, by Emerson G. Reed. Just published by D. Van Nostrand Company, 265 pages, illustrated. Price $3.00.

"The Practical Railway Spiral" by L. C. Jordan, C.E. Published in 1913 by Van Nostrand Company. 155 pages. Price 50c.

ELECTRICAL NEWS, 347 Adelaide St. W., Toronto, Ontario

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A Woman's Favor is Secured

We make a grade
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Resistance requirement
in wire, ribbon
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More than
20 years
Experience

Henry Wiggin & Co. Ltd.
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Stocked in Montreal

By using ductile—true to gauge Resistance Wire in your Cookers, Toasters, Heaters, Irons, etc.

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For continuous service.

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for Sustained Accuracy
Through Years of Service

THE GEORGE C. ROUGH SALES CORP'N. 134 CORISTINE BLD'G. **MONTREAL**

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We stock only the most reputable lines such as:

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ARC-RAD

AR 1 LIST $20

This little set designed to use the Northern Electric peanut tube is a model of simplicity and efficiency. It is mounted in a neat walnut finished cabinet, with Formica panel and nickeled binding posts and metal parts.
Let us tell you about our dealers' proposition and liberal discounts

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Box 52, Amherstburg, Ont.

KLITZEN

REGENERATIVE—

Receiving Sets

Real Radio Simplicity

Only one adjustment

Licensed under Armstrong Patents

The principal feature of No. 525 Regenerative Tuner Detector, 2-stage audio amplifier is SIMPLICITY.
Any operator can get wonderful results because there is only one adjustment. Receiving Range practically the same as that of the best radiophone equipment on the market.
Each unit carefully tested before shipment. The best material and most highly skilled workmanship employed—it is the product of experts who have been making radio equipment since 1913.
JOBBERS AND DISTRIBUTORS. Write for full information and big discounts. DEALERS—ask your jobber or write us.

KLITZEN RADIO MFG. CO., Inc.
Racine, Wis.



MODEL No. 525 LIST PRICE **$80.00**

"UNITED"

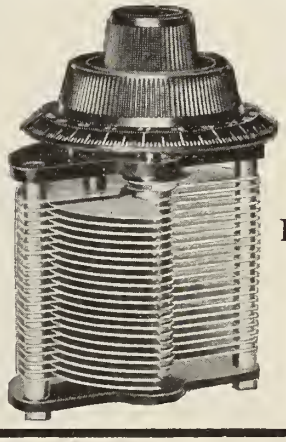
Radio Condensers and Transformers



have so fully demonstrated their excellence in every corner of the United States that our Canadian cousins may feel the utmost confidence in their satisfactory performance.

Our annual output runs into so large a volume that our new $1,000,000 plant will be taxed to supply the demand.

The "United" Audio Frequency Amplifying Transformer is a little masterpiece of radio engineering, magnetically shielded. Ratio, 5 to 1.



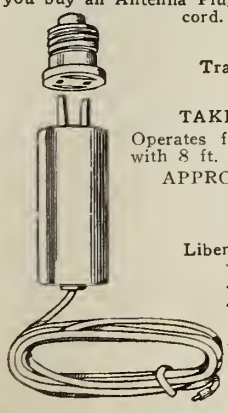
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Trade **"NO AERIAL" RAD-O-PLUG** Mark

TAKES THE PLACE OF AN AERIAL
Operates from any electric light socket. Complete with 8 ft. cord.
APPROVED BY NATIONAL BOARD OF FIRE UNDERWRITERS
PRICE $2.50
Liberal discounts to jobbers and dealers
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Reliable Mica Insulation
OF EVERY DESCRIPTION
Commutator Plate Motor Ring
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MICA COMPANY OF CANADA Ltd.
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FOR ELECTRICAL PURPOSES

CABLES, ROD CONNECTIONS, TUBE AND FLAT BUSBARS.

IT IS ALSO INCORPORATED WITH ADVANTAGE IN THE MECHANICAL DESIGN OF MACHINES AND INSTRUMENTS.

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British Aluminium Co.
Limited
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HIGH GRADE
BRUSHES

Carbon, Graphite, Metal Graphite

For ALL TYPES of Motors and Generators

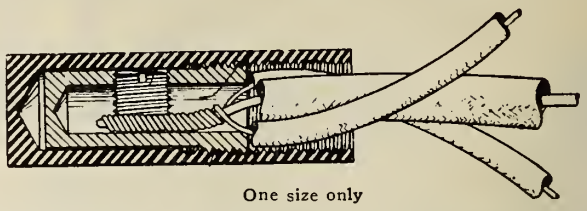
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38 Duke St., TORONTO
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One size only

Insulated Wire Connector

Approved by the Hydro Electric Commission Laboratories Approval No. 985. Also Underwriters Laboratories.

For Wiring Fixtures

Takes Two to Eight No. 18 Stranded Wires

Make joint in regular manner, leaving just enough wire to enter Connector, after twisting wires together leave only half-inch bare wire to enter brass tube, tighten set screw, then screw on insulation cap and

"YOUR JOINT IS MADE"

For Fixture Installation

Take Any Condition

Scrape off outlet wire insulation half-inch, scrape off fixture insulation wire one inch, twist fixture wire around outlet wire, insert in brass tube, tighten set screw, then screw on insulation cap, and

"YOUR JOINT IS MADE"

Ask Your Jobber or Send for Sample

Sole Manufacturer

W. P. MARR - 102 Russet Ave.
Toronto - Ont.



Announcement



We are now completely equipped, by the addition of three new kilns, to supply the electrical trade with the highest grade

MADE IN CANADA

Porcelain Products—including Knobs, Tubes, Cleats, Covers for Conduit Fittings and Specialties.

We also manufacture a complete line of Edison Brass Sockets.
We guarantee the utmost care in packing and quick action on all orders.

Service and Satisfaction is our Motto

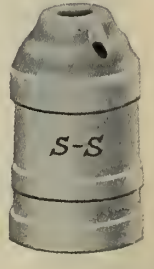
No need of going outside of Canada for anything in this line.



SMITH & STONE LIMITED

Electrical Manufacturers

GEORGETOWN - - - - ONTARIO



Representatives:
Montreal:—I. W. Levine, Room 4, Marcil Trust Bldg.
Winnipeg:—Russell, Fowler Co., 505 Electric Railway Chambers



16¼ Miles
3 Conductor 250,000 C.M.
Paper Insulated Lead Covered Cable
13200 Volts Working Pressure

Manufactured and Installed for

The Toronto Electric Commissioners

To Their Specifications

Insulation .42″
Lead Sheath .16″
Approximate Outside Diameter 2.6″
Approximate Weight Per Foot 10.5 lbs

Northern Electric Company
LIMITED

MONTREAL TORONTO WINDSOR CALGARY
HALIFAX HAMILTON WINNIPEG EDMONTON
QUEBEC LONDON REGINA VANCOUVER

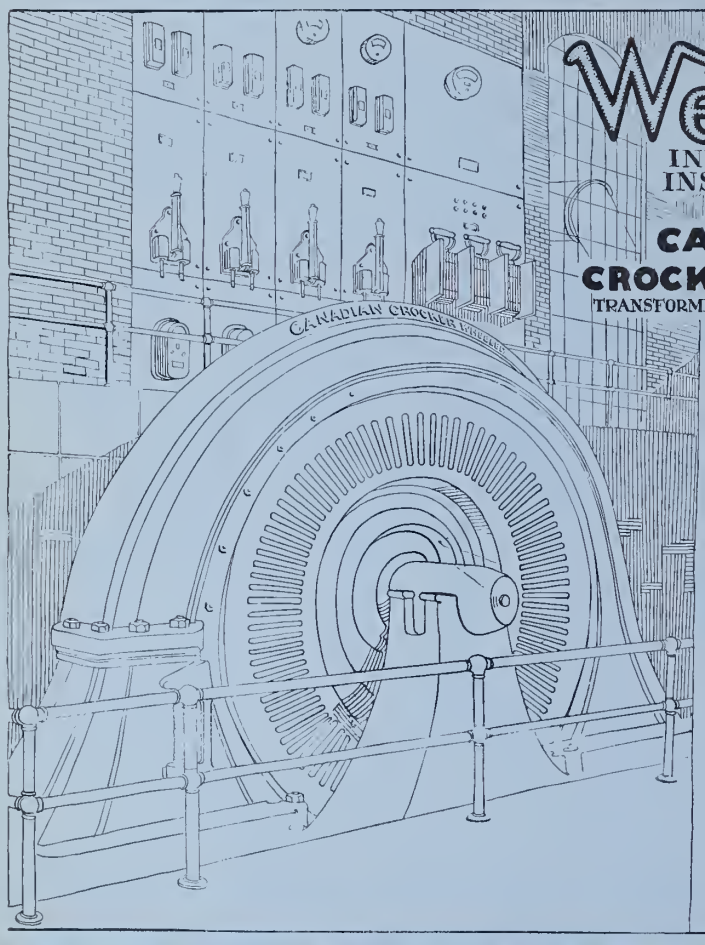
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Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
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Construction Material
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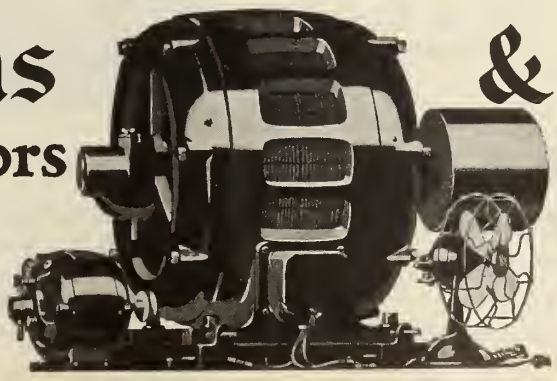
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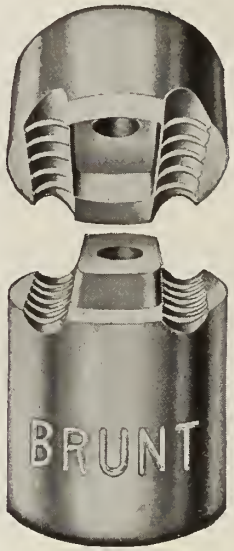
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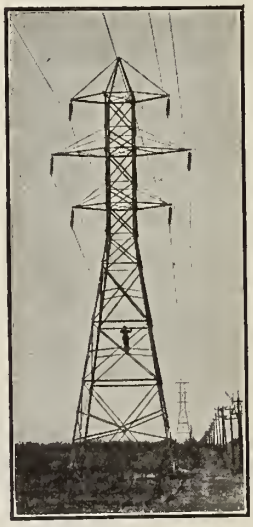
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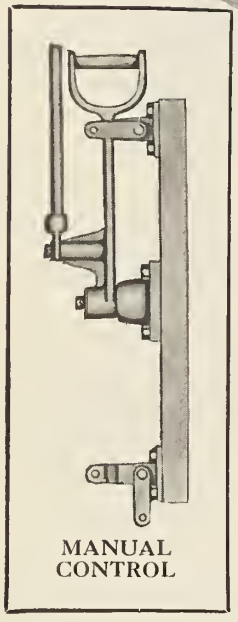
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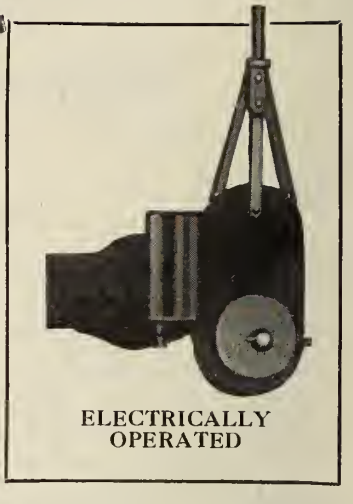
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Hydro Managers and Private Dealers Getting Closer Together

Giving The Individual Electric Merchant a Fair Deal

This is The Aim of the Hydro Municipalities if the Convention Recommendations are Carried out. A Paper of Keen Interest to the Contractor Dealer.

By J. E. B. PHELPS
Chairman Servicing Committee, A.M.E.U.

(1) A policy should be adopted of making all sales of electrical merchandise under the principle of "Satisfaction guaranteed or money refunded." The interpretation of this policy in detail should be liberal and broad. The customer should be educated to believe—and have reason to believe—that the Hydro Shop has confidence in the articles sold to such an extent that if the customer is not satisfied—for any reason—the article may be returned for exchange or credit, and that the transaction will be carried out with cheerfulness, promptitude and courtesy.

(2) The Hydro Shop should select its goods with care and discretion, so that only appliances and articles of sound construction and quality may be offered to Hydro customers. We believe that it is better to lose some sales through failure to stock cheaply constructed or poorly designed articles, than to obtain the sales at the expense of having the inevitable resulting dissatisfaction attach itself to the Hydro Shop. In other words, put quality first, and we think that the sales, under proper guidance, will take care of themselves.

(3) Do not let the completion of the sale end the transaction. Make the customer understand that you are selling, not an article, but the completely satisfactory use of that article. Furthermore, do not leave off when you have planted that idea; actually follow it up. Just how this can be done depends on many things; the degree of enthusiasm and sincerity of the manager of the Hydro Shop; the amount of elbow-room (financially) permitted by his commissioners: the degree of sympathy on the part of his commissioners towards merchandising by the Hydro Shop; the population of the municipality; the degree of wealth of the community; the number of other merchants handling electrical appliances. This makes it impossible to particularize. In general, the extent to which the



Mr. J. E. B. Phelps

sale of appliances is followed up in the home should be as great as the financial resources and latitude of authority will permit. . In any event, no sale of any of the higher priced appliances should be considered as complete, until at least one call has been made by a representative of the Hydro Shop at the home of the pur-

chaser, in order to assist the user of the appliance in learning to operate it in the correct way.

(4) As to repairs, the same factors as enumerated in No. 3 will largely control the policy. No Hydro Shop should embark upon the merchandising of electrical goods unless it is prepared to render the very best repair and maintenance service that its resources will permit. Almost every electrical device contains one or more parts subject to deterioration or wear and the purchaser of the article is entitled to a service which will renew these parts when they fail, with the greatest celerity and at a moderate cost.

The extent to which repairs can be made without sending articles back to the factory, depends largely upon the size of the municipality and each Hydro Shop must be guided by its local conditions, but the basis of the policy is simple and might be stated as follows: Repair parts should always be kept in stock and facilities provided for making repairs locally up to the limit of the resources of the Hydro Shop; repairs required beyond these resources can best be made at the factory. We are not in favor of the Hydro-electric Power Commission of Ontario maintaining a repair department, and are convinced that the factory is the proper place to make repairs beyond the capacity of the Hydro Shop. "Lending appliances" should be kept on hand, which the customer can use while his appliance is being repaired. Particular attention should be given by the manager to speed of execution of repairs, and a high grade of workmanship which will ensure to the owner an appliance returned in first-class operating condition, and with its appearance unmarred by its trip through the repair shop.

(5) It is of prime importance to the utility to keep all the appliances in the homes of its customers, at work, and not lying idle on shelves owing to break-downs or defects. To accomplish this, it is necessary to get into the homes of the customers, and each Hydro Shop must devise a method best suited to its own conditions. In some cases the meter reader can obtain the entree. In other cases a special man can be assigned to the duty, but it is impossible to lay down any one scheme capable of universal applications.

(6) Profits from the merchandising of electrical goods by the Hydro Shop, should not be considered as an addition to surplus and used for the reduction of rates, but rather as a fund created for use in buying publicity to aid in selling the idea of the use of electrical goods, and for expenditure in servicing the devices when they have been placed in the homes of the consumers. The use of profits in this way will tend just as strongly towards lower rates, through improvement of the municipal load factor and consequent improvement in net revenue.

(7) The appliance sales manager should be a constant reader of electrical magazines, thus keeping himself posted on merchandising methods of others who have been successful. Along this line we would recommend that a freer exchange of ideas on merchandising and servicing of appliances be made through the medium of the Hydro Bulletin.

Educational and Advertising Committee Report

The Educational and Advertising Committee beg to report, that after due deliberation the following points suggest themselves as methods by which the use of electrical appliances in the home can be greatly increased; the operation of Hydro Shops carried on on a scientific basis, and co-operation between contractor-dealers and Hydro Shops be greatly improved.

In submitting this report we are interspersing the discussions held relative to each point as it came up when discussed in sub-committee. The report is sub-divided into four general sub-divisions, A, B, C, D.

Under heading "A" have been suggested certain points for consideration for the betterment of merchandising methods. "B" and "C" deal with the education of the consumer and "D" with electrical dealers and contractors, who too often look with fear and suspicion on merchandising by central stations. The confidence of these men must be gotten and held, and their co-operation secured by the Hydro municipalities to permit of the fullest possible education of the consumer.

A. Proper Merchandising Methods

1. Not looking on private dealers as competitors but seeking to have a friendly spirit of co-operation.

After some discussion it was thought that this could be best brought about by Hydro managers taking the initiative in disarming the dealers by showing friendliness and a spirit of co-operation first. It was proposed that all local managers be advised of the proper way to co-operate with the dealers; also the results to be

desired from such co-operation, and that they should be advised of the desire of fostering a friendly spirit among them.

2. More interest in the fact that a customer has an electric appliance than in the fact that it may have been purchased at some place other than a Hydro Shop.

The friendly spirit that would be engendered by the methods proposed in (1) would instil a feeling in the consumers minds that electrical appliances of reliable character can be purchased from dealers as well as the Hydro Shop, and this will also cause dealers and Hydro Shops alike to pay attention to the servicing of electrical appliances, no matter where they have been purchased.

3. To place the Hydro Shop on a proper basis by making it pay its own way, bear its own proportion of expense, rather than be carried along at the expense of the light and power departments.

This is dependent upon a proper bookkeeping system.

4. Proper realization of what overhead expenses entail, and what should be a fair overhead percentage of sales.

It was suggested that the Burroughes efficiency expert address the next A. M. E. U. Convention, on overhead, or some such subject; this has already been done with very good results.

5. Maintaining a fair resale price on goods which will be uniform in all Hydro Shops, and discouragement of price-cutting except perhaps in shop-worn goods.

There is a great necessity for educating all local managers in the true cost of merchandising, to satisfy them that resale prices must be maintained.

6. Co-operation between Shops, so that one may help the other to move certain goods that may be selling slowly in one or more particular municipalities.

7. Interchange of good selling ideas.

The Bulletin and Sales Department of the Hydro Commission were deemed the proper media for disseminating ideas on merchandising to Hydro Shop managers.

8. What is the proper amount of stock to carry and what should be considered a fair turnover in the year?

This can best be determined by a proper study of the manner in which merchandise of all different classes carried in stock is disposed of, with particular regard to the locality, as what moves rapidly in one locality, may move slowly in another.

9. Encouraging every Municipality to maintain a high-class Shop, where only the best of electrical appliances can be purchased.

In this regard it was felt that Hydro Shops should establish the lead, and that they should municipality; also that only the very best of electrical appliances should be on sale in these shops.

10. While it is desirable to operate a shop with a substantial surplus each year, that should not be the main object.

The offering for sale of the best and approved appliances, having well-dressed windows, and advertising of a high order worthy of Hydro, education of the people to the advantages of electricity, and giving the consumer the best possible service, should be the first considerations.

11. Surplus earnings should be turned back into the business for the introduction of new devices, and the working out of further educational features.

12. Methods of stock-keeping, purchasing and accounting, such as would be found in any high-class establishment, should be introduced.

13. A uniform sign and advertising insignia should be adopted for use by all Hydro Shops.

14. Every appliance sold, particularly ranges and washers, should be thoroughly demonstrated to the housewife, as the proper understanding of the care and use of any appliance will save considerable servicing.

15. A uniform schedule for free servicing of appliances.

16. All Hydro officers and sales staff, including Head Office, should have talks at least every two weeks on the correct method of selling merchansing, and also discussion of the various appliances handled by Hydro Shops.

In connection with No. 16, no definite plans were made for conducting these talks to the Hydro sales staff, but an educational campaign must be carried on, and some method should be adopted for conducting talks at various periods to all of the staffs in Hydro municipalities. It was proposed in this connection also to canvass every Hydro employee, to find out what electrical appliance he has in the house, to see how far this talk on the use of appliances would have to be carried among our own people, before we try to educate the public.

Appliances Used by Hydro Employees

This was done, by distributing cards among the principal Hydro municipalities to be filled in by the employees, and to indicate what appliances were being used. Out of 490 cards returned, the following appliances were shown to be in use by employees:—

Irons	487
Toasters	349
Percolators	128
Grills	133
Vacuum Cleaners	203
Water Heaters	25
Dish Washers	1
Air Heaters	159
Clothes Washers	149
Ranges	105
Refrigerators	2
Miscellaneous	20

These results show that a great deal of effort

must be put behind sales to our own people before we can expect others to accept the theories and sales arguments used to dispose of electrical appliances.

"B" Advertising

1. Preparation of copy by a good advertising agency, and the furnishing of mats to the different shops. This to be prepared and furnished on certain schedule, which will permit of advertising appliances at the proper time each year.

2. Encouragement of the shops to tie-up their window displays with this advertising.

3. Preparations of pamphlets for distribution to the consumer with his monthly bill.

4. Arrangements for demonstrations and special displays.

5. Making use of the matter furnished by the Society for Electrical Development.

The secretary of the A.M.E.U., has already subscribed for associate membership in the S.E. D., and placed same at the disposal of the Sales Department of the H.E.P.C.

6. Suggestions for good window dressing.

"C" Education of Public on Proper House Wiring

1. Advantages of sufficient outlets.

2. Adequate service when house is built and rewired to permit of the fullest use of electricity.

3. This can be accomplished best by the modern "Electric Home" idea, which has already been successfully carried on.

Education of the public to proper house wiring is a subject which requires the co-operation of the contractor-dealers with the Hydro Shops, and in this connection this co-operation must be obtained before the public can be educated to the need for sufficient outlets.

Architects and building contractors should be approached when building permits are taken out, so that when buildings are contemplated some method can be employed to educate the architect and the contractor, and finally the owner, as to the advisability of installing sufficient outlets in the home.

"D" Education of Private Electrical Dealer and Contractor

1. Fostering kindly relations and the spirit of co-operation.

2. Getting them to look on the Central Stations maintaining shops, not as competitors, but as co-workers in extending the use of electricity.

3. Convincing them that the entering of Hydro into merchandising will not decrease, but increase their sales.

4. Their co-operation is absolutely necessary to carry out suggestions in "C".

Report of Purchasing Committee

The Purchasing Committee reported that through the Hydro sales department, they secured a list of all the appliances sold in the various Hydro municipalities during the year 1921, and the prospects for 1922, which was intended to be used as a means for co-ordinating the buying of electrical appliances for all Hydro Shops, to secure the very best prices and terms. A summary of this information was given to the members of the Committee but no action was taken.

Accounting Committee Report

The Accounting Committee had no meetings during the year, but the secretary reported that an accounting system to meet the requirements of the average Hydro Shop had been devised by him, and put into operation in two or three of the municipalities to try out; also that after operating for a year and ironing out the wrinkles in the system, that it was ready for universal adoption by all Hydro Shops, and that plans would be laid for installation of this system wherever necessary.

Printed Pamphlets

The Merchandising Committee appointed a Sub-committee, composed of M. J. McHenry, A. W. J. Stewart, L. G. Ireland, and G. J. Mickler to prepare, in printed form, a pamphlet containing what is thought best in each of them as a guide for Hydro Shop managers and appliance salesmen, carrying on their work as successful Hydro Shop managers; also to place in this pamphlet a discussion of the working of the accounting system, which it is desirable to keep.

The "Hydro Lamp"

The following resolution was put to the meeting:

It was moved by Mr. McHenry, seconded by Mr. Shearer, that the Merchandising Committee go on record as having faith in the HYDRO LAMP, and that if the Sales Department supplies local managers with cuts for advertising purposes, the local Commissions will support the HYDRO LAMP, with local advertising, to get it before the people as much as possible. The resolution was carried.

It was also resolved on motion by Mr. Shearer, seconded by Mr. Perry, that the Merchandising Committee go on record as favoring the continuation of the Hydro Sales Department acting as purchasers for various municipalities where requested, and that the development of the Department along the line of education and publicity be actively carried on, and that any loss in connection with such operations be considered by the H.E.P.C. as a general overhead expense, and charged to the municipalities as part of the cost of power. This was also carried.

The Merchandising Sales Bureau of the C.E.A. Also Made Report

Contains Some Splendid Suggestions for the Contractor-Dealer on Topics Such as Expense, Profit, Advertising and Guaranteeing Appliances—Do Electrical Men use Enough Electrical Apparatus?

By G. R. ATCHISON
Chairman Merchandising Sales Committee

In presenting our report dealing with the work done during the past year your Committee has confined itself to such subjects as were decided on at our first committee meeting, as being of outstanding importance, and those which we believed would be of the greatest interest to all members. We sincerely hope that these different subjects may call for considerable discussion, and that some good may result therefrom. There are many problems in connection with merchandising electrical appliances and supplies which are causing much concern and these have been even further accentuated by business conditions which have existed during the past two years. We believe that an exchange of ideas and experiences of the different members will go far towards helping to a better understanding between the different factions of our business, and give us a clearer insight as to how to find a solution of these problems.

Our report is based on a study of the following subjects.

1. The selling expense involved and the discounts allowed to dealers on appliances.
2. Co-operative and Educational advertising
3. Helps to Contractor-dealers by Manufacturers, Jobbers and Central Stations.
4. Electric ranges.
5. Compensation to salesmen.
6. Guarantee on appliances.
7. Merchandising outlets.
8. Use of electrical appliances by those in the industry.

Selling Expenses

The first subject is one on which there has been much discussion, and one which is of very great importance to the advancement of electrical merchandising. We have endeavored to make a close study of the subject, but unfortunately have not been able to accomplish much with regard to segregating the expense involved in the sale of our merchandise. We have, however, been able to secure certain information from member companies, giving a figure dealing with their total cost. From this we find that the selling expenses involved represent in most cases a cost of 30% on the selling price, and in some cases as high as 35%. These figures have been secured from different sections of the country, so that they may be taken as fairly representative. They have further been secured from contractor-dealers and central stations, and are based on costs involved in the operation of an electrical retail store, including rents, salaries, taxes, advertising, delivery, bad debts and all other regular expenses.

Our study of this subject leads us to believe that many of us are not thoroughly familiar with the actual selling expenses, particularly in the case of central stations, and we believe this to be of sufficient importance to warrant detailed expenses being kept. In the case of central stations, this could be somewhat similar to the manner in which operating and maintenance expenses are tabulated. We are sure this would bring forth some very valuable information, and would do much towards helping find a solution for this problem. As the situation exists today there are very few in the business who are confining their sales efforts in one direction only. In the case of the contractor-dealer he has both the contracting end, involving wiring and contract work, and the sale of electrical appliances, making it very difficult for him to know actually how much it does cost to retail appliances. In the case of the central stations, in many instances, the cost of selling appliances is charged up to securing new business for increased revenue, again making it difficult to arrive at selling costs.

The merchandising of electrical appliances is worthy of being considered on its own merits,

as a retail proposition to return a net profit, over and above all expenses, and should be considered as such. If this fact were generally recognized, we could look forward to a better answer as to the spread which should be allowed to a dealer.

Where is the Profit?

When it is considered that in many cases the discount allowed the dealer on appliances does not exceed 25%, from the resale price, and that the average cost of selling is 30% on the selling price, it does not leave much doubt as to the amount of profit which may be expected on the total business done, at the end of the year. Our business should develop to immense proportions as we educate the public to the need of electrical materials and appliances, both from a domestic and commercial aspect, and taking the wonderful developments and advancements which have been made in other groups of the industry, as a basis, we could surely hope to arrive at some solution, if it were given serious consideration and thought by each one interested. We would recommend to the executive that a committee be formed, consisting of at least one member from each group, to make a study of this subject, with the object of endeavoring to improve the situation as it now exists.

In making a comparison of the cost of selling in our business with that of other lines, our figure does not appear at all unreasonable particularly when cognizance is taken of the fact that many of our appliances must be demonstrated in the prospect's home, and also that extended payments must be allowed if any volume of sales is to be expected.

Advertising

On the second subject dealing with Co-operative and Educational advertising; your committee has secured figures as to the cost of instituting an advertising campaign to educate the public to the advantages, conveniences and savings to be gained through the use of electrical material and appliances. This should do a great deal towards stimulating sales, and also help reduce the selling costs through eliminating some of the expenses involved, both in locating prospects and greater ease in closing the sale.

This co-operative advertising could take the form of a series of "ads" dealing with different subjects, such as electric cooking, washing machines, vacuum cleaners, and other appliances, an "ad" on each subject appearing in different newspapers through Canada, on a regular pre-arranged schedule. For example, an "ad" of uniform size and make up on electric cooking would appear in papers from Vancouver to Halifax, in the case of daily papers on the same day, and in the weekly papers the same week. This "ad" would be a message citing the advantages and conveniences of electric cooking, but would not deal with any particular make of electric range, but solely with the thought of selling the public on the idea of electric cooking

In the case of the washing machine and vacuum cleaner, the same thought would be carried out, emphasizing the advantages and conveniences, together with the low cost of operation. When it is considered that the cost of operating these appliances for a month, averages about fifteen cents and ten cents respectively, we should certainly try and acquaint the public with these facts, together with figures on other appliances, as the general impression seems to be that it costs a "great deal" to operate our appliances, and this must surely tend to retard the sale. We have certainly done very little to educate the public to the extremely low cost of using electrical appliances. When an electric washing maching can be used in the average home for a month at a cost of about fifteen cents and all its other advantages are considered, we surely have a wonderful message to broadcast, and this applies in like measure to other appliances.

The cost of this co-operative advertising could be borne jointly by manufacturers, central stations, jobbers, and where possible by dealers. Where any of this group are now carrying on a definite advertising schedule, a certain proportion of their advertising appropriation could be applied for this purpose.

We have all figures as to the rates of the papers in the different cities, together with other necessary information, this having been kindly tabulated and furnished to us by the Advertising Service Company, Montreal, to whom we wish to acknowledge our indebtedness.

Co-operative advertising campaigns of this nature have been conducted in other lines with great success, and it would appear that we would be quite reasonable in assuming that we could hope that this would be the means of creating a greater demand for our appliances, and also have a great educational value. We certainly need something like this, as today practically all sales of at least the bigger appliances are made in the prospect's home; our store sales being quite small in proportion to the total amount of business done. This plan is respect-

fully submitted for the consideration of the different members interested.

Dealing with the question of our regular advertising, we would suggest that consideration be given to adopting a schedule showing at what periods certain appliances should be advertised, similar to that made up by the Society for Electrical Development. If this were generally followed out it would also have a good effect on educating the public, as our "ads" would be somewhat of the nature of a "broadcasted message."

Helping the Contractor-Dealer

On the third subject dealing with helps to the contractor-dealer by central stations, manufacturers and jobbers: While the contractor-dealer now plays no small part in the development of our industry, we believe that he will continue to play an even greater part in the building up of our business in the future.

Anything we can do to strengthen this link in our chain just goes to make the whole group so much stronger.

Helps to the contractor-dealer could take the form of electrical homes, sales talks and demonstrations on appliances by manufacturers or central station representatives, lighting sales demonstrations, and an endeavor to bring him closer to the other groups, particularly to the central station, where co-operation between these two groups would be of mutual benefit, and tend to a much better understanding. Where this co-operation exists, a much more friendly relationship with the public is bound to follow—as the policy of the central station, as far as the public is concerned, is in many cases, as explained to them by the contractor-dealer who has wired their house or sold them certain appliances.

Electric Ranges

On the fourth subject dealing with electric ranges, we have endeavored to complete certain statistics and information along the lines of:—

1. Sales Methods.
2. Cost of Operation.
3. Load Diversity.

Sales Methods:

There is no doubt but that electric cooking is gaining rapidly in favor, and that we may look for an increased demand for Electric Ranges each year.

It is necessary, however, that an aggressive sales policy be adopted to have the sales reach a satisfactory volume, and we must take advantage of every opportunity to get our message to the public.

Store demonstrations, exhibitions, domestic science schools, bazaars, lectures before women's clubs, newspaper advertising and systematic mailing of circulars and advertising matter, are all good mediums for arousing the interest, selling the idea, and creating the desire for an Electric Range in the home. It is necessary to supplement these efforts by having salesmen who are experienced in Electric Ranges systematically call on prospects, and it will be found that in many cases, the sale is closed in the prospect's home, the same as in the case of a washing machine or vacuum cleaner.

It may also be necessary at times to install a range in the prospect's home on trial. While this, of course, should not be encouraged and only used as a last resort, it will not be found to work out at all badly, as in practically every case, once the range is used by the prospect for a few days, she becomes thoroughly sold on the idea of electric cooking, and the sale is closed without any further difficulty. It is, of course, absolutely essential that before the range is used by the customer, careful instructions be given as to the care and operation.

It will also be found necessary to allow extended terms of payment on many sales. The usual time is 12 months, covered by equal monthly payments, with an initial payment on delivery. A sale of this nature should, of course be covered by a lien, so that in case of default of payment, the range can be repossessed. It is not often where this has to be done, but where it is necessary, the range can usually be re-sold without any loss.

It is certainly very pleasing to note the progress being made by the different manufacturers in making their ranges so much easier to repair. This is an important step forward, and will do a great deal to even still further popularize the electric range, as maintenance costs may be kept down to a reasonable amount.

We have secured the following figures at different rates, on the cost of operation in different sections:

2¼ Cent Rate

Rate		Average Monthly Con. kw. h.	Average Monthly Cost 8 customers
2¼c.	Alternative rate of	121	2.73
2¼c.	1c. per kw. h.,	171	3.86
2¼c.	plus standby charge	245	5.47
2¼c.	50c per switch and	218	4.90
2¼c.	plug per month	271	6.19
2¼c.		242	5.45
2¼c.		242	5.44
2¼c.		295	6.64

Average consumption per month	243 kw. h.
Average monthly bill	$5.47
Total number of ranges in service	600 ranges
Average cost of installation to customer	$35 to $40

3 CENT RATE

Rate	Average Monthly Con. kw. h. 9 customers	Average Monthly Cost 9 customers
3 cents	128	3.84
3 "	143	4.29
3 "	165	4.95
3 "	126	3.78
3 "	166	4.98
3 "	125	3.75
3 "	201	6.03
3 "	220	6.60
3 "	210	6.30

Average consumption per month for 1330 customers	111
Average monthly bill—1330 customers	$365
Total number of ranges in service	1330
Average cost of installation to customer	$30.00
Average kw. h. consumption per year for 1330 customers	1466
Average yearly revenue from 1330 customers	44.00

2 CENT RATE

Rate	Average Monthly Con. kw. h. 16 customers	Average Monthly Cost 16 customers
2 cents	190	$3.80
Average kw. h. consumption per month		190
Average monthly bill "		$3.80
Total number of ranges in service		300

2¼ RATE WITH ALERNATIVE

Rate	Average Monthly Consumption 50 customers	Average Monthly Cost 50 customers
2¼c with alternative of 1½c. per kw. h., plus standby charge of $2.00 per month on 6 element range	250	5.50 on straight meter rate 5.75 on meter rate plus standby charge.
Average kw. h. consumption per month		250
Average monthly bill		$5.60
Total number of ranges in service		350
Average cost of installation to csutomer		$33.00

4 to 2 CENT RATE WITH SERVICE

Rate	Average Monthly consumption of 15 customers	Average Monthly cost 15 customers
Service charge 3 cents per 100 square feet of floor space. For first 3 kw. h.—4 cents per kw. h.—balance at 2 cents per kw. h. less cash discount of 10%.	kw. h. 162	3.40
Average kw. h., consumption per month		162
Average monthly bill		$3.47
Total number of ranges in service		200

Compensation to Salesmen

We believe there are between 50,000 and 60,000 electric ranges in use in Canada at the present time, representing a consumption of approximately 140,000,000 kw.h. per year, and a demand of approximately 50,000 kw. to 60,000 kw.

Our fifth subject covers the question of compensation to salesmen. In making a study of this we find many different plans being carried all of which have certain merits. Straight commission alone has worked out very niecly with outside salesmen, and has the tendency to keep a good man on the job all the time, as he figures the more he does, the more he gets paid. This plan, however, has the disadvantage of a salesman feeling that his time is his own, to do as he sees fit, as he figures he is only getting paid when he works. He further does not feel under the same obligation as a man on salary to turn in reports, or secure any information which is requested of him.

A plan of salary and commission also works out very nicely in many cases applying to both outside and inside salesmen. In the case of the outside salesmen, a small salary, together with commission gives an opportunity for better supervision over their work, and also makes the salesman realize that he is under certain obligations to make up reports, and do any other work which is asked of him. Both these plans work out well, depending upon working conditions, but it is generally felt that the straight commission basis offers a much greater return to the salesman, if he will produce results.

One of our member companies has recently tried, with considerable success, a plan of a bonus system to salesmen, on a straight salary, for all sales over and above a pre-determined quota. Another member company has paid all their employees a "bonus" in the form of a small commission for all sales which they were able to effect after regular working hours. This applied to meter readers, store clerks, wiremen, etc., and was the means of causing a considerable increase in their sales.

Another form which has been used, has been to pay a salesman a fair amount as a regular monthly salary and supplement this with a very small commission on all sales handled through the store. This plan, however, does not lend itself to being generally adopted, but depends altogether on the type of man employed. In any event, it would hardly be advisable to apply this plan until the salesman had been in the employ for some time.

Straight salary is, of course, being used quite generally, but there is little doubt but that an outside salesman will work better when he is on a basis where a commission is involved.

The many different plans of compensation in force just emphasizes the difficulties experienced in securing high grade salesmen. These plans are all being tried out, to try and arrive at some satisfactory compensation under which a good man can be retained. We might just mention here that one of the most serious problems in Electrical Retailing seems to lie in securing of high grade salesmen from whom could be expec-

ted an average amount of business each month. Our business calls for men of the right type, as our appliances necessitate "intelligent selling." We want men who can be trained to sell Electrical Appliances, and whom we can figure are going to stay with the business, help its development and grow with it.

Guaranteeing Appliances

In our sixth subject we deal with a subject which undoubtedly has had considerable thought from many members. At the present time most manufacturers guarantee their appliances against defects for a period of one year. In the event or a defect occurring in any appliance after it has been sold, the manufacturer replaces the defective part free of charge, but it is necessary that the dealer return the defective part, transportation charges prepaid, and also that he pays transportation charges on the replacing part, and if he furnishes the necessary labor free of charge, the service costs mount up very quickly, and in many cases are far in excess of the part which the manufacturer has furnished free of charge. As these service charges are a very heavy drain on the retailer, we believe that we would be well advised to consider adopting a standard practice of charging the customer for the necessary labor incurred in replacing defective parts. There would possibly be some cases where this could not be applied, but these could be generally considered exceptional, as in the case of an appliance proving defective, after having been in use only a day or two. It is necessary that we keep the customer satisfied, but we hardly believe a customer would object to the charge, if the guarantee which was given at the time of the sale read in such a manner.

This would certainly relieve the retailer to a great extent of one of his fairly heavy items of expense.

Merchandising Outlets

On the seventh subject covering the question of Merchandising Outlets: While we feel that as much of our material and appliances as possible should be handled through the regular electrical channels, still we believe that it would be impossible to confine it to such consequently, we should endeavor to establish good relations with those outside of our regular channels, who are handling our appliances. An effort should be made to bring them into our local associations, and also interest them in our activities. This applies particularly to Departmental and Hardware stores. We venture to say that there would be less price cutting, and that we should not have so much reason to complain of electrical appliances being more or less used as a "football" to further the sale of other goods.

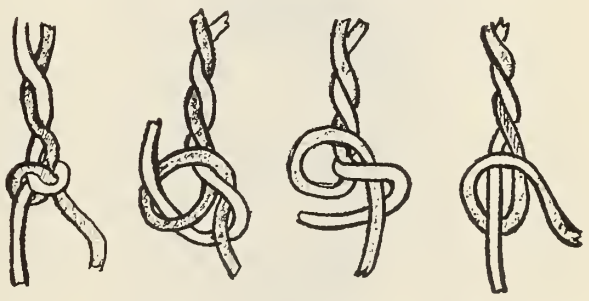
Electrical Men Using Electrical Appliances

On the eight subject, dealing with the number of electrical appliances in use by those engaged in the industry; recent surveys which have been made along these lines indicate that only a very small percentage have more than a few appliances in use in their own homes. It would undoubtedly help the sales of appliances to quite an extent, if they were more extensively used by our own members, as more enthusiasm would be shown by everybody in trying to get these in the homes served with electricity. We would be able to give a more intelligent and convincing message to these people, as to advantages, conveniences and saving in the use of electrical appliances, and how they would help them in their homes.

An Approved Knot

The majority of short circuits occurring in pendent sockets and the attachment-plug caps of portable electrical appliances, according to the Underwriters' Laboratories are due to loose strands of the flexible cord, which become separated from the terminals, when the binding screws or terminals are loosened.

This loosening is frequently the result of the omission of a knot or its equivalent in the cord



inside of the cap of the socket or attachment plug, the strains due to pulling separable connections apart or dragging portables around by their cords being transmitted directly to the small binding screw connections.

The so-called "Underwriters' knot," illustrated herewith, provides an easily tied strained relief forming a rather flat knot which will fit snugly in the recess provided for the purpose inside the cap of pendent sockets and attachment plugs.

The Manitoba Electrical Association

After Most Successful Year the Old Executive Steps Down. New Officers Going in Are Young in Years But Old in Experience and Full of Confidence and Enthusiasm

At the general annual meeting of the Manitoba Electrical Association, officers for the ensueing year were appointed. A. M. McFadyen, manager of Western Division of the Standard Underground Cable Co. of Canada Ltd., was elected president, and M. H. Wilson, office manager of the Standard Underground Cable Co. of Canada, Ltd., Winnipeg office, was elected secretary-treasurer.

The executive was elected for a two year term as follows: C. A. Clendenning, Winnipeg Hydro; J. E. Lowry, Commissioner, Manitoba Telephone System; Fred J. Pratt, Winnipeg Electric Railway Co.; Jim Swan, Winnipeg Hydro; W. H. Reynolds, Eugene F. Phillips Electrical Works Ltd. For the one year term, the following were elected: Fred T. Shipman, McDonald & Willson Lighting Co.; Carl T. Kummen, Schumacher Gray Co. Ltd.; W. Sibbald, Sibbald Electric Co.; R. D. Smith, Filer-Smith Machinery Co. Ltd.

The association is looking forward to a big year under the new executive. Art. McFadyen, the new president, while young in years, is one



Mr. A. M. McFadyen

of the oldest electrical men in Western Canada, and has always taken a prominent part in anything pertaining to the betterment of the electrical industry. He is anxious to have a committee of electrical men give short talks in the schools to the children on "Electricity." Art has been on the executive of the Manitoba Electrical Association on several occasions, so is familiar with association work. Matt. Wilson, the newly appointed secretary-treasurer, has been a member of the Manitoba Electrical Association for several years.

J. E. Lowry, the retiring president, is to be congratulated on the splendid year that the association has just passed through; it has been



Mr. M. H. Wilson

the best financial year that the association has known. Morris E. Deering, the retiring secretary, came in for a great deal of praise, he has always been a hard worker for the Association, and everything pertaining to its betterment.

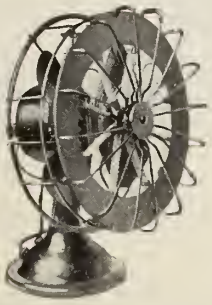
Electrical Home Under Way

It was stated at the meeting, that the Electrical Home is getting well under way, and the wiring is now started. It is expected the "Home" will be completed about the middle of August. It is being built by a contractor, who is leaving the matter of the electric wiring in the hands of the Manitoba Electrical Association. When completed, the association is to have use of it for two weeks. A sum of about $3,700 will be spent for advertising purposes, the newspapers will be carrying large space, there will be cards inside and outside the street cars, a large electric sign in front of the Home, bill boards, posters and other means of making the Home known to the general public.

The Latest Developments in Electrical Equipment

Hot Breeze Hair Dryer

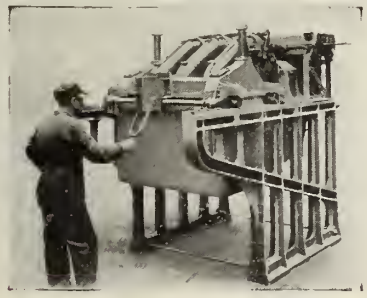
A device that attaches to any ordinary fan, and that is also capable of being used as a hot plate, is being marketed by Stoughton Manu-



facturing Company. The fan forces the air over the hot coils, giving a warm breeze. The heater is sold either with, or without, the fan as desired.

Ferguson Pailin Switchgear

The extensive line carried by Ferguson, Pailin, Ltd., whose Canadian office is located at 321 King Street, East, Toronto, includes switch-



boards, switch panels, circuit breakers, choke coils, disconnecting switches, etc. The accompanying illustration shows the rugged construction of their Type "H" armourclad switchgear.

Brantford Electric Ironer

The Brantford Washing Machine Company have under construction at the present time an electric ironer which will be shown at the Canadian National Exhibition this year. This ironer will be equipped for heating the shoe electrically. It will have a full 37 in. roll and is specially equipped to sit on the Locomotive Electric Washer motor power being derived from same. It will be a very popularly priced domestic article.

Unit for Bowling Greens

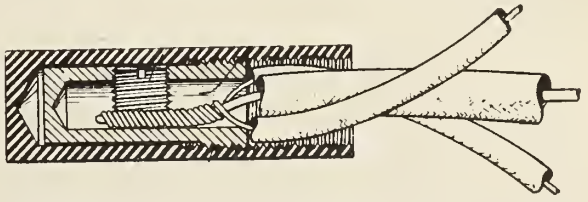
Powerlite Devices Limited, successors to A. H. Winter Joyner, Limited, are marketing a type of lighting unit that is found especially



suitable for bowling green illumination. The appearance of the unit is shown in the accompanying illustration. Good illumination with no shadows, is the feature claimed.

"Marr" Insulated Wire Connector

W. P. Marr, 102 Russett Avenue, Toronto, is manufacturing an interesting device designed to save time in the wiring and installation of electric lighting fixtures. It consists of an interior fibre shell, containing a brass cap and screw, which receives the wires, as shown in the accompanying illustration. The connector will take stranded wire and the same connector will take from one to eight No. 18 wires, or combinations



of other sizes, so that it meets any condition occurring in practical fixture work. Joints are very easily made by twisting wires together, leaving one half inch bare wire, which is inserted in the brass tube. The set screw is tightened

and the joint is made. The advantages of the connector over the ordinary soldered and taped joint are easily seen. One point is, of course, the saving of time. There is also the fact that the joint is cheaper and there is no dirt or fuss, an important point in certain installations where damage might occur to walls or furnishings from paste, solder or torch. This connector can be used over and over again, a useful quality when fixtures are moved or rewired.

New Line of Portables

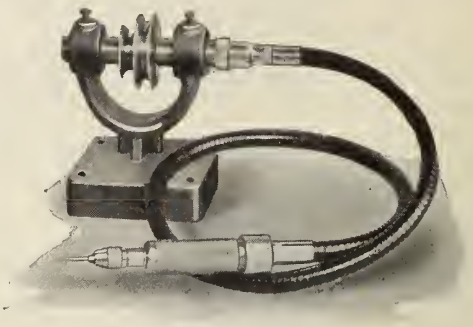
Consolidated Lamp and Glass Co., Coraopolis, Pa., has just introduced another new line of portables, comprising 71 table lamps and 20 boudoir lamps. They have been designed to



answer the lighting requisites of homes for the living-room, hall, and reading-room. Hand-decorated shades in a variety of colors and tints make these new portables particularly adaptable to the much desired harmony in fine hame furnishings.

Mica Undercutter

A mica undercutter, as shown in the illustration, is being marketed by Weidenhoff Products. Its action is described as follows: With the armature held in one hand, the undercutting of the mica is accomplished in a manner similar to sharpening a lead pencil. A standard dental cutting burr is mounted in the handpiece on the end of the flexible shaft. With the handpiece held in the palm of the hand, it is guided by the fingers and thumb with little effort to follow the slot in the commutator, as is shown



in the illustration. Spiral and straight slots are thus undercut with the same degree of simplicity and speed.

Citco Loud Speaker

The claim that the Citco Loud Speaker reproduces radio reception without vibration or distortion, is made by the Canadian Independent Telephone Company, who are marketing this



device. The horn has a steel stem with brass elbow and 14 inch aluminum bell. An adjusting lever, located on one side, gives values of tone and volume as delivered.

Prominent Electrical Contractor Dealers

—12—

J. A. ST AMOUR, MONTREAL

From a modest commencement, J. A. St. Amour, has attained a prominent position in the French Canadian electrical contractor-dealers' sphere of Montreal. His electrical education commenced under N. Simoneau, one of the oldest electrical contractors in the city. He then worked for the Royal Electric Company, the Edison Company, and the Bell Telephone Company. Later, he was connected with the Canada Electric Company, and after several years of service with that concern, started as a contractor on his own account about 16 years ago. Mr. St. Amour does not disguise the fact that it was an uphill fight for some years, as he started with very little capital. However, he gradually improved his connections, and eight years ago decided to further expand by going into the electrical supply business. He accordingly opened a store at 2173 St. Dennis St., where he has continued ever since. Mr. St. Amour has undertaken some large contracts, one of the most recent being for the installation of the first automatic telephones in the Province of Quebec. This will be of fifty stations, and will be installed at Ste. Hyacinthe.



Mr. J. A. St. Amour

For some time, Mr. Amour was secretary of the French section of the Electrical Contractor Dealers' Association of the Province of Quebec. He is a firm believer in trade associations, particularly in relation to co-operation in protecting a trade from unfair competition, and also from the point of promoting measures which will advance the interests of its members. The social side of trade associations is not to be overlooked, in that it cements the bond of friendship, and is calculated to dissipate trade jealousies. It takes time to develop organizations of this character, and the results of the work are generally of slow growth, but in Mr. St. Amour's opinion, those results are certain, if the members are united and are persistent in their efforts.

Illuminating Engineering Society Convention

The 1923 Convention of the Illuminating Engineering Society is to be held September 24 to 28 inclusive at Lake George, N.Y. A unique program of entertainment is being provided and unusual spectacular lighting features are being planned.

Using Power From Malay Falls, N. S.

Ratepayers of New Glasgow and Trenton, N. S., recently voted in favor of public ownership of an electrical distribution system to make available to these towns the power from the hydro-electric development at Malay Falls, sheet Harbor. The vote was on the question of authorizing a bond issue of $275,000 for this purpose. Stellarton has not yet voted on the question but the town council has pronounced in favor of a similar arrangement.

Wiring Contracts Awarded

Barrie, Ont.

Thos. Burton, $4,000 house.

Blairmore, Alta.

F. Dunkley, $13,000 garage.

Brampton, Ont.

Davis & Holleys, $7,000 ea. 2 stores & apts.

Brantford, Ont.

T. Minnes, $35,000 church.

Brockville, Ont.

Beaton & Davis, $8,000 lodge.

Edmonton, Alta.

Hillas Elect. Co., $114,444 isolation hospital.

Ford, Ont.

Jos. Corbin, $4,500 house.
Gilbert Campeau, $4,500 house.
Gilbert Campeau, $4,000 house.

How Does the New Sales Tax Affect You? Here is a Resume of the Changes Brought Down by the Minister on June 20

The new law respecting Sales Tax which will come into effect January 1st 1924 is contained in Bill No. 230 which was introduced in the Dominion Parliament on June 20. The Bill provides for a sales tax of 6% on sale price of all goods produced or manufactured in Canada, subject to certain exemptions, to be payable by the manufacturer at time of sale, and also provides for a similar tax on the duty paid value of all importations, to be paid by the importer.

Also on Canadian goods sold by a licensed wholesaler or jobber to other than a licensed manufacturer or producer, to be computed on the price paid for the goods by the licensed wholesaler or jobber.

It is provided that in certain instances the purchaser is to be furnished with a written invoice of the goods sold, which invoice shall state separately the amount of the sales tax. This provision applies to sales by licensed manufacturers and by licensed wholesalers to wholesalers or jobbers who are not licensed under the Act. The provision also applies in respect of goods sold by an unlicensed wholesaler or jobber to a licensed manufacturer.

Exemptions From Sales Tax

Goods exported are to be exempt from the tax; also goods sold by a licensed manufacturer to another licensed manufacturer, or by a licensed wholesaler to a licensed manufacturer, to be used in, wrought into or attached to articles to be manufactured for sale and which are subject to the tax; also goods sold by a licensed manufacturer to a licensed wholesales or jobber; also goods sold by a licensed manufacturer or by a licensed wholesaler to a Provincial Government for the latter's own use; also goods sold by an unlicensed manufacturer, and good specified in the list of exemptions under the present law.

Materials for Re-Manufacture

After January 1st, licensed manufacturers will buy domestic materials for re-manufacture into other goods for sale, free from sales tax, provided the finished product is subject to sales tax when sold. If the person or firm from whom the raw material is purchased has paid a tax on such material, such firm will be entitled to a refund or deduction of the tax so paid.

A manufacturer importing raw materials to be re-manufactured into other goods for sale will be required to pay a tax of 6% on the duty paid value at the time of importation, subject to a refund of the sales tax paid on the imported raw materials when the finished product is sold, provided the finished product is subject to sales tax when sold.

A manufacturer who manufacturers goods which are exempt from sales tax will not be entitled to purchase raw materials to be used in the manufacture of such products free from tax, and on imported raw material he will not be entitled to a refund of the tax paid on importation. Likewise a manufacturer who does not receive a license, by reason of the fact that he does not manufacture or produce goods to be value of $10,000 or more during any fiscal year, will not be entitled to purchase raw materials free from tax nor to obtain a refund of the tax paid by him on imported raw materials. Such a manufacturer, however, does not have to account for sales tax on his sales.

Refunds

The first part of sub-section 8 provides for a refund to be granted to licensed manufacturers if the tax paid by them on imported materials when used in the production of a finished article is not exempt from tax.

Sub-section 8 provides that where a licensed manufacturer or a wholesaler or other dealer sells goods, on which tax has been paid, to a licensed manufacturer for re-manufacture into articles for sale, and provided the finished article is subject to the sales tax when sold, a refund of the tax paid will be granted to the vendor, manufacturer, wholesaler or dealer.

Sub-section 8 provides for a refund of the tax paid on all goods which a licensed manufacturer or a licensed wholesaler has on hand on January 1st, 1924, where such goods have been, are being, or are to be used in, wrought into or attached to articles to be manufactured or produced for sale, provided that the finished articles when sold are subject to sales tax. All

refund claims under this proviso must be presented on or before June 30th, 1924.

Sub-section 9 provides for a refund or reduction, not to exceed 25% of the sales tax, in respect of goods manufactured and sold in Canada when similar goods may be imported free of customs duty.

Sub-section 10 provides for a refund of sales tax on the re-exportation of imported goods on which customs duties have been refunded. This section also provides for a refund of tax on domestic goods which are exported.

Provision is also made in the Bill for a refund to a manufacturer, producer, wholesaler, jobber or other dealer of tax paid on goods sold to a Provincial Government for the latter's own use.

The provision in last year's sales tax law for drawback of 99% of sales tax paid on materials used, wrought into or attached to articles exported, remains in force.

Contracts Prior to May 12th, 1923

Under the provisions of Sub-section 11, where a manufacturer made contracts of sale before May 12th, 1923 on the basis of the present sales tax, and goods are delivered in respect of the contract after January 1st, 1924, the Government will allow a deduction equal to the difference between the 6% rate and the rate in force when the contract was made. But no deduction will be granted in respect of deliveries made under such a contract after March 31st, 1924. All claims for such deductions are to be filed on or before June 30th, 1924.

Rentals, Royalties, Custom Work Etc.

It is proposed to apply the 6% tax to goods which are leased without being sold; to goods on which a royalty is payable; to goods manufactured by contract for labor only, and apparently, also, to goods which are manufactured for the manufacturer's own use and which are not to be sold.

Stamp Tax on Cheques—Tax on Receipts

The reduction in the maximum stamp tax on cheques and bills payable on demand from $2.00 to $1.00 is not to take effect until August 1st next. Other documents subject to the stamp tax, such as time bills of exchange, overdrafts and advances by the bank, continue liable to a tax of 2 cents for each $50,000 or fraction thereof of the full amount. The changes in the receipt tax come into effect on August 1st, 1923.

Tips on Soldering Aluminum

Various compositions of zinc-tin and zinc-tin-aluminum solders give the best results. The tensile strength of a good aluminum solder is about 7,000 lbs.-in.^{2}, for those with higher tensile strength have, in general, their temperature of complete liquation too high for soldering purposes. As a rule the strength of an aluminium soldered joint depends upon the type and upon the workmanship. Soldered joints of aluminum which are to be exposed to moisture should be protected against corrosion by a paint or varnish.

Westinghouse Electrical Supply Catalogue

The Westinghouse Supply Catalogue, generally regarded as an encyclopedia of things electrical, is now being distributed. This issue for 1923-24 replaces and supersedes all catalogues issued heretofore on electrical supplies by the company.

Duncan Electrical Specialties Catalogue

The Duncan Electrical Company, Limited, Montreal, are distributing their catalogue No. 8 of electrical specialties. A large variety of wiring devices are listed in this publication.

Book Reviews

"A Symbol of Safety" by Harry Chase Brearley, is a volume that gives a popular exposition of many phases of the work of the Underwriters' laboratories. The volume is written in an entertaining way and explains freely the features and functions of the Laboratories in their relation to the electrical industry.

"Elements of Radio Communication" by Ellery W. Stone, is a book that deals with the subject from the physical rather than the mathematical standpoint, without sacrifice of technical accuracy, in order that the subject matter may be readily grasped by the layman. It covers the entire subject from the elementary principles up to the most modern installations, embodying the most recent data on radio—frequency generators, air craft radio, vacuum tubes, and radio-telephones broadcasting. The book is well illustrated with 145 illustrations and 39 plates. Over 300 pages, cloth bound, $2.50 net.

In a laboratory in Cleveland radio waves one-fiftieth of an inch in length have been produced.

Current News and Notes

Bancroft, Ont.

The Bancroft Marble Company will use a considerable block of power from the new development on the York branch of the Madawaska River, North Hastings, Ont.

The Bancroft Light, Heat & Power Company was recently incorporated with a capital of $1,000,000.

Campbellford, Ont.

As soon as preparations for the building of No. 8 dam and power house, near Campbellford, Ont., are out of the way, work will be started on another similar plant to be known as No. 9. This with the dam at Belmont Lake, by which the level of that body of water will be raised 30 feet, and the building of a six-mile canal to connect the lake with the Trent River at Healy Falls, will mean a big addition to Hydro power resources.

Calgary, Alberta.

The Canadian Pacific Railway Company's tourist camp at Lake Windermere is now electrically lighted. It is a beautiful camp on the Banff-Windermere Trail, consisting of a club house, and about thirty small cottages among trees, on the edge of Lake Windermere. Electrical Engineers Ltd., Calgary, supplied and installed the complete electrical equipment.

Chatham, Ont.

Sanderson and Chandler have recently opened a new store on Queen St., Chatham, Ont. They are doing all kinds of motor winding, battery charging and repair work.

R. Keemle has been recently appointed manager of the Chatham, Wallaceburg and Lake Erie Railway, in succession to W. J. Curle.

Des Quinze Falls, Que.

Construction machinery is being rushed in to the new power development at Des Quinze Falls, seventeen carloads having already been ferried across Lake Temiskaming to North Temiskaming, where they are now en route into the camp over a Government road. Over two hundred men are at work on the site.

Fergus, Ont.

The Shellar Electric Co., Guelph, have been awarded the wiring contract for St. Andrew's Church, Fergus.

Fairville, N. B.

H. D. Baird has opened an electrical store in Fairville, N.B., under the name Baird Electric Co. He will do a contracting and appliance business. Mr. Baird was formerly with the Jones Electric Company of St. John.

Fredericton, N. B.

A delegation, proposing that the new Brunswick Electric Power Commission construct a transmission line in the immediate future from a connection with the Maine and New Brunswick Electric Power Lines at a point in Maine down the St. John River Valley to Woodstock, appeared before the provincial government on June 13. Places served would include Woodstock, Hartland, Florenceville, Bath and other towns.

Grand Lake, Newfoundland.

Armstrong-Whitworth & Co., Ltd., have awarded to William I. Bishop, Ltd., of Montreal, the contract for the design and construction of a hollow reinforced dam, about 1,080 ft. long and 75 ft. high, on Junction Brook near Grand Lake, Newfoundland. This dam is part of the power development scheme in connection with the new 400-ton paper mill that is being built at Corner Brook.

Glace Bay, N. S.

Electrical contracts for improvements to plant of Dominion Coal Company, have been awarded to Canadian General Electric Company for a $30,000 sub-station, and to the English Electric Company, for a $60,000 electric hoist.

Harriston, Ont.

Harriston council has granted $5,000 for the purpose of extending the hydro service.

Kenora, Ont.

A report states that extensive remodeling is being undertaken in the power plant of the Backus-Brooks Co. 6 horizontal units will be replaced by vertical units.

Kitchener, Ont.

An underground cable has been laid on Strange Street. This will supply the waterworks plant.

Midland, Ont.

An application has been made to the Hydro

Commission of Midland, Ont., for an additional 700 horsepower to serve an extension to the G.T.P. elevator.

Montreal, Que.

Montreal City Council recently rejected the by-law authorizing a new kind of electric sign to be erected in Montreal, by which the illumination is supplied on the under side of the sign through glass letters, instead of as at present from electric bulbs on the outside of the sign. The project was attacked on the ground that this kind of a sign did not give much illumination.

Montreal, Que.

The Wright Electrical Company has officially established its head office at 1715 St. James Street, Montreal.

Moncton, N. B.

Mr. John L. MacDonald has an up-to-date electric retail shop at 379 St. George St., Moncton; carries a good assortment of fixtures, lamps, etc., also household labor saving appliances; also does electric contracting. He has just completed the electric installation in the new Municipal Home, which is a credit to the city.

New Glasgow, N.S.

Ratepayers of New Glasgow and Trenton recently voted in favor of an electrical distribution system, using hydro power from Malay Falls.

North York Township, Ont.

Estimates for the cost of Hydro-electric service are being forwarded to the township authorities.

Ocean Falls, B. C.

A 6,300 h.p. Pelton double-overhung reaction turbine is being installed at the power plant of the Pacific Mills, Ltd., Ocean Falls, B.C.

Ottawa, Ont.

Among items passed during a discussion of estimates of the department of marine and fisheries recently was one of $500,000 to provide for the construction of lights and aids to navigation including regulation of traffic in the Detroit River. This shows an increase of $100,000 over last year.

Ottawa, Ont.

At a meeting of the Ottawa City Council on June 19, the Mayor and Board of Control were authorized to ascertain if the Ontario Railway and Municipal Board has the power and right to operate the Street Railway in the event of a strike.

G. Gordon Gale, M.Sc., Vice President and General Manager, Hull Electric Co., has been elected Vice President, Royal Ottawa Golf Club.

Penticton, B. C.

Installation has just been completed by the Penticton Electric Co. of a large irrigation pump and motor for the Provincial Government on its Southern Okanagan Irrigation Project. The pumping plant consists of a 33 h.p. 2,200 volt, Westinghouse motor and Rees-Roturbo pump, and is located two miles south of Oliver, on the east side of the main road.

Peterboro, Ont.

Tenders for the construction of the new substation were opened at a meeting of the Peterboro Utilities Commission recently, and the contract awarded to V. C. Hayes at a cost of $31.-809. Nine tenders were received, ranging from $41,984 to the successful figure.

Peterboro, Ont.

A heavy electrical storm in Peterboro, Ont., put part of its local distribution out of action for a time. The damage was quickly remedied by a repair crew.

Mr. Frank Sherwood, 110 Lock Street, Peterboro, has been appointed radio inspector for the city of Peterboro and district.

Quebec, Que.

The expenditure of a sum of $30,887.00 for the installation of a modern and permanent lighting system at the Exhibition Grounds and in the buildings was approved by the Public Works Committee of Quebec, recently.

It is stated that the name of the Public Service Corporation and the Q.R.L.H. and P. Co., when amalgamated, will be the "Queebc Power Company, Limited," which will include all the subsidiaries.

Regina, Sask.

The City of Regina is installing one 225 h.p. motor to operate at a speed of 400 r.p.m.; one 200 h.p. motor to operate at a speed of 1,200 r.p.m.; and one 300 h.p. motor to operate at a speed of 1,800 r.p.m. These motors are to be used for driving existing pumps which are now being driven by a steam engine and steam turbine. Fraser & Chalmers, Montreal, are supplying these units.

St. Catharines, Ont.

General Superintendent E. W. Oliver of the Niagara, St. Catharines and Toronto Electric

Railway, which is now part of the Canadian National System, recently outlined what Sir Henry Thornton proposed to do in the way of improving the railway. The plan involves expenditures in St. Catharines, Port Dalhousie, Merriton and Thorold, aggregating $2,300,000, exclusive of equipment. Of this amount, between $250,000 and $300,000 is estimated to provide for a new passenger terminal located between Balfour, Welland and Geneva streets, and a new freight terminal.

St. John, N. B.

The New Brunswick Power Co. is relaying the track on Dock and Wall Streets, St. John, with new 82 lb. rails on new ties.

The contract for the repair work on the dams at the hydro deevlopment at Musquash has been awarded to the Allain Construction Co., Ltd., of St. Stephen, and the N. B. Contracting Co., Ltd., of St. John, it was announced by C. O. Foss, chief engineer for the N. B. Electric Power Commission. The reason for having two companies to do the work was that it was important that repairs be effected as speedily as possible.

St. George, N.B.

An electric light system is being installed. Power will be supplied by the St. George Pulp & Paper Co.

St. Stephen, N. B.

Vanstone & Murphy have opened up an electric dealer-contracting business in St. Stephen, N. B.; they have a very nice and well lighted store. Both these young men have had from 5 to 7 years' electrical experience.

St. Thomas, Ont.

The Roberts Electric Company, successors to the Roberts & Sandham Electric Company, are carrying on business at 531 Talbot St., St. Thomas, where their store is known as "The Electric Shop."

Sault Ste. Marie, Ont.

There is still ten thousand second feet of water available in the St. Mary's Rapids for the development of 16,000 horsepower, under an effective head of eighteen feet, according to the report of the Hydro-Electric Power Commission of Ontario, which has been presented to Sault Ste. Marie Utilities Commission.

Selkirk, Man.

Winipeg, Selkirk and Lake Winnipeg Ry., Winnipeg Electric Ry. subsidiary, is reported to be discussing with the Selkirk, Man. Town Council, a proposition for leasing Selkirk Park, and operating it in conjunction with the railway.

Stratford, Ont.

In order to avoid the confusion incident to employees being absent from various departments all through the summer the Hotpoint Works of the Canadian General Electric Company will close down from July 23 to August 6 to give all the staff a holiday at the same time.

An extensive addition to the Hydro shop is being built in Stratford, Ont.

Sturgeon Falls, Ont.

Plans are being prepared for a transmission line from Sturgeon Falls, Ont., to Fort Frances, Ont.

Toronto, Ont.

An addition will shortly be made to the Davenport Road sub-station if the Hydro-electric Power Commission.

A report states that Ontario Government has authorized the construction and operation of a radial line from Toronto to Oakville, by the Hydro-electric Power Commission.

Vancouver, B. C.

British Columbia Electric Railway Co. reports gross earnings for the month of April at $852,992, as compared with $818,177 for April, 1922.

Completion of the British Columbia Electric Railway Company's hydro-electric plans at Alouette and Stave lakes will involve a total expenditure of $10,000,000 and increase the total capacity of the company's system to a total of 208,000 h.p. Several years will be required to carry out the scheme but the first section of the work, the construction of two dams at Stave Falls, will be completed this fall, the cost of this work amounting to $1,000,000. The Ruskin plant, when completed, will develop 80,000 h.p.

Unconfirmed reports state that surveys of the water power available on the Columbia River on the main line of the C.P.R. are now being carried out, with a view to future electrification of the line through the Rockies.

Verdun, Que.

Ratepayers will have submitted to them a by-law calling for an expenditure of $19,000 on transformers and lighting system.

Vernon, B. C.

Vernon, B. C. city council will supply light and power to Coldstream municipality. The

transmission line will be approximately 3-1/2 miles long.

Windsor, Ont.

G. Campeau, of Windsor, Ont., an electrical contractor for the past 14 years, recently opened a new store and is dealing in electric fixtures and appliances. A feature of this store is its location, which is at 831 Wyandotte Street, East, the main street between Windsor, Walkerville and Ford. The store is of fair size, having a frontage of 25 feet by 50 deep and is nicely stocked with fixtures and appliances.

W. R. Ker of Windsor, has recently opened a new store at 428 London St. W. Windsor, for the sale of electrical supplies. Mr. Ker is well known to the electrical trade having been connected with the Moloney Electric Co. for some years; he has become agent for the Westinghouse range and appliances, the Kelvinator electric refrigerators, and the Dominion, Coffield & Sunnysuds electric washers.

Welland, Ont.

Sanger Ferris has gone into the electrical contracting business in Welland, Ont. He is shortly going to stock a variety of appliances.

Winnipeg, Man.

The contract for the supply of six 150 kw. service transformers for the city system, has been awarded to the Moloney Electric Company of Canada, at a price of $3,534.

Gross revenue for May of the Winnipeg city hydro is approximately $147,000, more than $11,000 over that for the same month last year, according to the official report. A good deal of the increase is due to the wider use of appliances, the demand for which continues to be great.

Julian C. Smith visited the Grand Falls plant of the Manitoba Power Company while en route to the coast.

Woodstock, N. B.

Judgment authorizing the Woodstock Railway, Light & Power Company, Limited, to enforce temporarily an increased schedule of rates while supplying current by steam power, was recently rendered by the New Brunswick Board of Public Utilities. In the new schedule the rate for domestic lighting is increased from ten to fifteen cents a kilowatt hour.

Zurich, Ont.

The net surplus as at December 31, 1922, of the Zurich, Ont., hydro-electric system, as shown by a report, is $988.70. The total assets are $12,293.04. Zurich, up to the end of last year has sixty-three domestic light customers and forty-two commercial light customers and three power users.

Wiring Contracts Awarded

Fredericton, N. B.

Wm. Boone, $3,000 motor service station.

Hamilton, Ont.

G. H. Evoy, $9,000, 2 houses.
J. A. Dynes, $13,500 store.
J. Fish, $29,000 house.

Kentville, N. S.

Percy De Fry, $5,000 house.

Kitchener, Ont.

Central Elect. Co., $16,000 houses.
Mattell & Bierwagen, $4,800 house.
F. Kress, $4,500 house.

Leamington, Ont.

A. E. Law, $4,000 house.

Montreal, P.Q.

J. A. Champagne, (2599 St. Hubert St.) house.

E. A. Gregory, pr. semi-detached houses.

Canadian Comstock Co., Ltd. (10 Cathcart St), $3,000,000 off. bldk.

Vincent & Say (334 Union Ave.) $30,000 repairs to house & garage.

New Hamburg, Ont.

Geo. Morley, $5,000 house

Oakville, Ont.

B. E. Sprowl, $20,000 garage.

Ottawa, Ont.

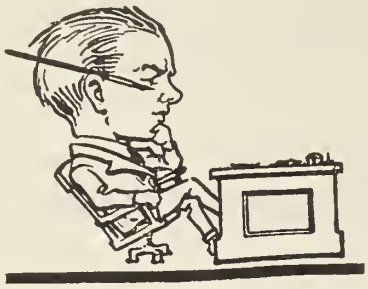
J. Cherry, $9,000, 2 houses.
M. Dubois, C/o G.C. $8,000, 2 stores.
Rideau Electric Co. $5,000 house.
J. A. Ellicott, $10,000 duplex house.
J. Cherry, $4,000 house.
E. G. Tressider, $6,000 house.
Art. Davis, $10,000 house.
E. G. Tressider, $30,000 apts.

Outremont, P. Q.

J. O. Beaulieu, (2332 St. Urbain St., Montreal), apt. house.

Peterborough, Ont.

Miller, Powell & Watson, $30,000 alts. to S. S.



The Editor Comments

"Customer Ownership" Popularity

If the average delegate were asked what he considered the most important topic introduced at the C.E.A. convention he would probably reply in the majority of cases—"Customer Ownership." In the opinion of many of the brightest central station men this is the best solution of our present difficulties. Municipal ownership was called into being in our industry because the man on the street was desirous of having an interest in the development and distribution of electric energy. The load has proven too heavy in many cases however and many citizens would be willing to relinquish their responsibility if it could be done without, at the same time, losing touch with the electrical industry. The desire of the consumer for a small financial interest in the operations of the local central station, is probably just as keen, too, in the districts where municipal ownership has not taken root as it has in Ontario or those sections of the East or West where it has been in operation for years. They hesitate to take the extreme course however. Customer ownership of central station securities seems to meet the wishes of this class and it is easily possible that the future may witness a gradual return of present municipal operations at various Canadian points to private management where it can be arranged that the general public will be given an opportunity to share in the profits and have a voice in the management.

That the holding of stock by the consumer makes a friend and a booster for the company has been shown beyond doubt. Numerous stories were related at the recent convention of the support given, oftentimes in the most unexpected manner. As one example of many—tenders had been called for the cartage of certain materials; one of the tenders was much lower than the rest and on enquiry the carter stated that he was a 'shareholder' in the company and eager to give it every advantage.

The idea has taken such a fast hold in the United States that already some of the companies report twenty-five per cent. of their securities held by their customers. In Canada the Southern Canada Power Co. stands alone in its effort. They have sold about 10 per cent. of their stock to their customers however and are planning further vigorous campaigns. The executive of their company is very enthusiastic about it.

Losing Money on Merchandising

No less a person than the vice-president of the Commonwealth Edison Company of Chicago, generally considered one of the best managed central station organizations on the continent, stated at the C.E.A. convention that he had just found out a few months ago that his company had for years been carrying on the merchandising of appliances at a heavy loss. He had made a thorough investigation of the merchandising department and had found that the mark-up allowed by his company was not sufficient to cover the overhead alone.

If such a state of affairs can be found in such a large, well organized company, it would seem to be the part of wisdom for other companies to make similar investigations. It is at least possible that many of our central stations, both private and municipal, are also being deceived. One frequently hears the complaint of the private electric merchant that his "spread" is insufficient, but the answer generally offered is "inefficiency." This same answer cannot apply to such a large company as the Chicago Edison after they have made a thorough investigation, and if they found a forty per cent mark-up necessary it is a fair conclusion that the private merchant requires about the same.

The manufacturer claims that he cannot give larger discounts. Why not approach the problem from the other end and do away with the fixing of the retail price? One or the other seems an absolute essential. More sales effort

is needed and the stimulus to effort is 'profit.' Nothing can be more foolish or unnecessary than trying to sell electrical appliances on the basis of low cost. They can be sold on merit. Let's give the merchant a good profit and the volume will soon automatically take care of itself.

Give the Private Merchant A Chance A sign of the times is seen in the change in the complexion of the C.E.A. program. It was a very recent criticism that too large a percentage of the topics was devoted to technical matters and too little to merchandising. Not so this year! Practically the whole of Friday was given over to papers all of which had a decidedly commercial flavor, and even the Thursday discussion developed along these lines. As President Davies expressed it—the technical side has been developed to such a point that it is able to take care of itself. He did not mean, doubtless, that the technical side would or could be neglected, but merely that its importance had become established, and interest in it assured, while the same is not yet true of merchandising.

It is very gratifying that both the C.E.A. and the A.M.E.U. are taking an active interest in merchandising, for it is a many sided problem. It is not enough, however, that their interest should merely take the form of entering the merchandising field and studying the problems of better merchandising. No study or treatment of this subject can be complete or productive of results unless it includes the contractor-dealer, the private electric merchant, and his relation to the industry. Neither the private nor the municipal central station can afford to ignore the private dealer. Not only that, but it will be very much to the interest of the central stations to develop the private dealer and help him in every possible way to become an efficient merchant. To that end competition must not be such as the private dealer cannot meet. Merchandising prices must be maintained; terms of payment must not be given the consumer by the central station that the private dealer cannot give; and in every way the central station must play the "big brother" part to the small dealer, not for sentimental reasons but in order that the small private dealer may develop into a big one, with big sales turnover and big enough profit to remain in business permanently. The biggest need of our industry is an aggressive, well-established, well-rated merchant class.

Rural Underground Distribution A keen interest is being shown in the underground cable distribution work of the Hydro-electric Power Commission of Ontario. This is pioneering on the part of the Commission in an endeavor to give the rural populations a dependable, cheap service and it is apparently meeting with success. The cost of the line works out at rather less than the cost of overhead and the maintenance is also lower. The Hydro engineers are getting the cost per mile of single phase cable underground down to about eight hundred and fifty dollars which is probably less by two hundred or two hundred and fifty dollars than the best that can be done with overhead construction.

In the earlier stages of the work some difficulty was encountered with mechanical obstructions, such as stones, tree roots, culverts, etc., but these are now being avoided largely by running the trench inside the farmers' fences. Of course the line is kept as close to the fence as possible but this arrangement simplifies the whole matter. The farmers do not seem to object and there is no apparent reason why they should; the cables are placed below the level of cultivation and the only danger would seem to be a gradual heaving of the cable by frost or the construction of cross drains. Of course the farmers' fields are not used except where considerable obstacles present themselves on the roadside.

A valuable consideration in connection with this underground work is the avoidance of unsightly pole lines and of the cutting down, or mutilation, of shade trees.

Developing Hemming Falls

Bonds are being issued by the Southern Canada Power Company in connection with the development of Hemming Falls.

In a descriptive circular it is stated that a complete hydro-electric plant capable of generating 30,000 h.p. will be constructed. There is an immediate demand for over 20,000 h.p. The properties of the company on completion of development work about to be carried out will consist of hydro-electric plants having a developed capacity of 44,000 h.p. and undeveloped powers capable of a further development of 110,000 h.p.

New York programs are to be rebroadcasted on a large scale in Canada.

Ontario's Municipal Engineers' Semi-Annual Convention

A Profitable day Spent on the Severn River and at the Hydro-electric Generating Plant —Papers and Discussions on Transformers, Underground Distribution and Merchandising.

It would not be very difficult to find more "swanky" convention headquarters than those provided by the Orchard Point Inn, where the Association of Municipal Electrical Utilities convened on June 13, 14, and 15, but it would be impossible to locate a place where good fellowship, considerate hospitality, wholesome living conditions and wonderfully beautiful natural scenery combine to make an ideal holiday. The town of Orillia is widely known for the cordial welcome it extends to visitors. By whatever road one approaches the town one is met by the sign "Welcome to Orillia" and as one leaves, by a "Good-bye, call again." That spirit seems to pervade the citizens—glad to see you come, sorry to see you leave. The town is a splendid example of efficient team work. Every citizen is a booster.

And so it came about that the delegates to the A.M.E.U. convention received a most hearty welcome. Mayor Tudhope was much in evidence; so was the chairman of the Orillia Hydro-electric Commission, Mr. C. H. Hale. Another prominent citizen who took a most effective interest in the boys was Mr. J. C. Miller. He it was who came to the rescue on Thursday evening when the big dance was on and produced a bevy of Orillia's most attractive young maidens. Mr. Miller also acted as chairman at Wednesday evening's dinner—evidently chosen because he was the best chairman the town could produce.

Mr. R. H. Starr is the manager of the Orillia Light, Heat, Power and Water Commission, and he lived up to the reputation that such a broad sounding title would suggest. He was indefatigable in his efforts to insure that every item on the program was carried out to the letter. He had worked hard for weeks in perfecting the plan of campaign and he redoubled his efforts to see that plan carried out. The success of the convention must give Mr. Starr an unusual degree of satisfaction.

Finally there was the genial secretary, Mr F. Gover, who forgot to either sleep or eat, so solicitous was he of the comfort and enjoyment of his guests. Every delegate who met Mr. Gover enjoyed the privilege. He is a decided acquisition to the Orillia Commission and we are told that the splendid success of the town's hydro-electric system is in very considerable measure due to his wise foresight. In its modern hydro-electric generating plant and distribution system the town of Orillia has a most valuable asset, and the fact that it has remained the property of the town and that the finances are in such excellent shape was the fortunate result, among other circumstances, of the commission's secretary being financially trained.

The Program

This convention was unique in that it combined a minimum of papers with a maximum of educational entertainment. Following the dinner on Wednesday evening the delegates listened to an exceedingly eloquent address by J. P. Downey, ex M.P., Supt. of the Provincial Mental



President A. T. Hicks

Hospital for Defectives, which is located at Orillia. On the following morning, bright and early, the delegates left by steamer for a trip up the Severn River to the city's power plant. Refreshments were served by the way, both going and returning, and a profitable hour and a half was spent at the plant. This is one of the most compact and efficient of the smaller hydro-electric power plants of Canada, and the spotless appearance of every square inch of the interior of the plant gave evidence of the seriousness with which the operators regard their duty of supplying continuous light and power to the citizens of Orillia some 20 miles distant.

It may be said in passing that the power house is also the location of one of the Government's locks on the Severn River, which is part of the Trent Valley canal system. This lock has not been completed, so that boats cannot yet pass down the river beyond the power house.

No program is ever complete without Wills Maclachlan and his life saving demonstration. Incidentally it may be added, however, that nothing on the program is more essential. While at the power house Mr. Maclachlan staged a little surprise for the visitors. One of the plant operators, E. Mincoff, was seen to climb a pole, become entangled in some way in the wires and fall across one of them. Like a flash, a fellow operator, C. S. Hurtubuise was up the pole after him; in a moment he had adjusted a rope which he carried with him around the body of the supposedly unconscious man and thrown the loose end over the cross arm where it was seized by two comrades, George Fountain and William Pauley. He then carefully released the wounded man who was lowered by his comrades to the ground.

The work of resuscitation then began; first Pauley, then Fountain relieving his partner, endeavoured to resuscitate the unconscious man by the prone pressure method. In a very few moments he recovered consciousness, was carefully placed on a stretcher and carried away.

The demonstration was particularly realistic and indicated to the delegates clearly enough that these operators had schooled themselves efficiently in life saving methods.

Some Played Golf

A number of delegates who had seen the power plant on previous occasions elected to give way to those less fortunate, and spent Thursday on Orillia's golf links.

President Hicks is Brief

In his opening remarks the Chairman, Mr. A. T. Hicks, spoke in part as follows:

"I want to thank you for the honor conferred upon me by the election to the position of president. Since we have come here we have experienced the warm fellowship which inspires the members and which seems to have flourished at its best here in Orillia.

"I believe that we are out to have a great convention. I trust that we will at all times throughout the several sessions keep in mind the responsibility we owe the Committees in preparing such a fine program. The program has been prepared with great care and with the earnest purpose of providing sufficient time for all needful discussion and of making this great gathering a source of mutual help and lasting inspiration.

"May I here pay tribute to the loyalty, faith and unselfish—yes, in many instances, sacrificing—service of the chairman Col. Sir Adam Beck and chief engineer F. A. Gaby of the Hydro-electric Power Commission of Ontario. It is an inspiration to have a part in its administration, because wherever one looks in the progress of electricity he is met with the vision of practical men giving practical service to the ideal of more efficient service.

"Few have earned such an enduring place in the esteem and affection of the members as the man who from the beginning of the association has been its secretary. We will never know our debt to S. R. A. Clement.

"We have attempted in the preparation for this Convention to limit the number of papers presented, in the hope, and expecting, that more time and consideration will be given to the discussion, and we trust the members will take advantage of the opportunity.

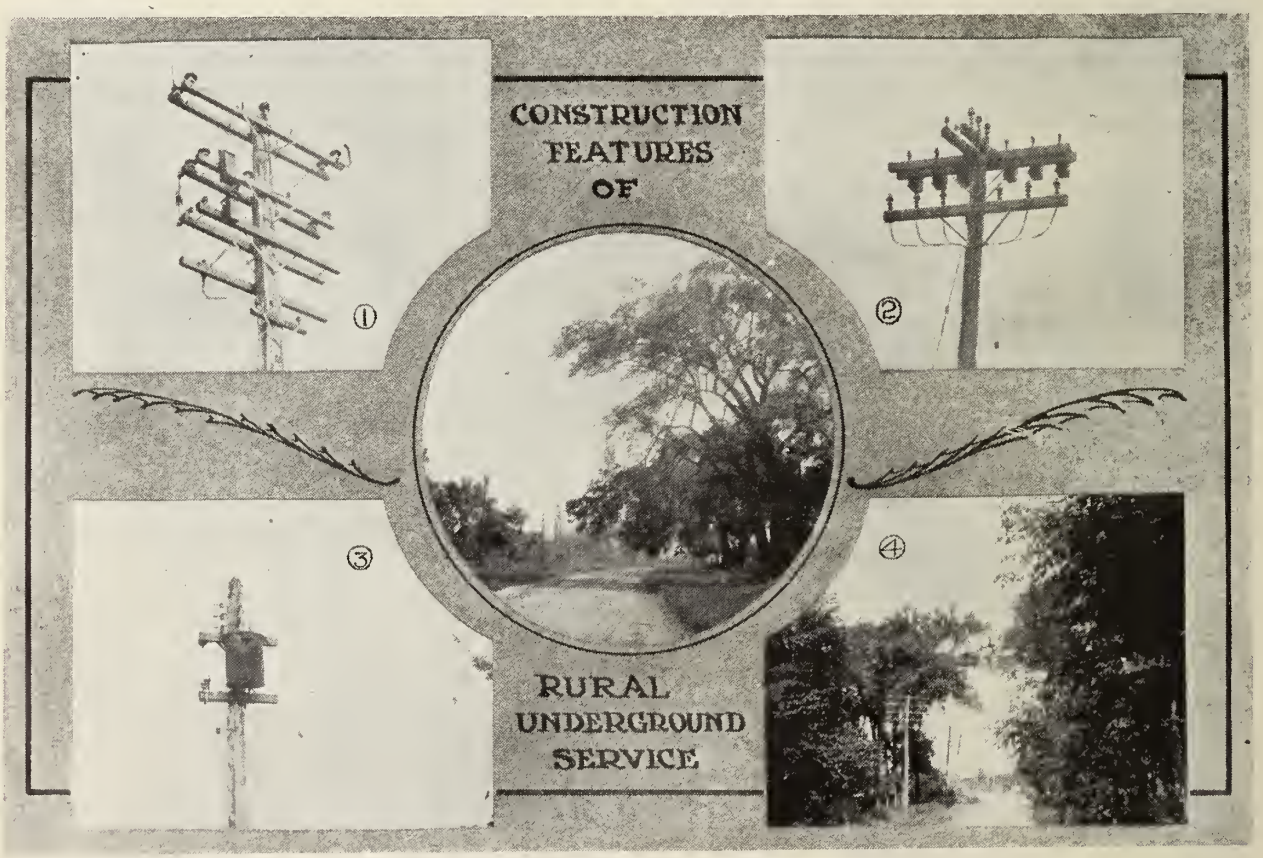
"Before we start, I want to make a personal appeal,—I want to appeal for prompt attendance after the opening of our sessions and for constant and faithful attendance. We can make this convention a great success if we are here on time and stay through the sessions. I appeal to you for your support in this regard, because it will make for the easy handling of the convention and assure that we get the best possible results."

The Ontario Hydro is Pioneering in Rural Underground

A. E. Lang, using Lantern Slides Shows the Delegates how the Lines are Installed and the Farmers Served with Power

A second paper on Friday morning by A. E. Lang, dealt with the rural distribution work of the Ontario Commission during the past two years. Comparatively little underground distribution had been attempted in rural districts and the success of the Commission's experiments has been followed with much interest all over the continent. A comprehensive article on the subject by Messrs. Lang and Purcell, printed in a recent issue of "Electrical News" brought the subject up to that date, and Mr. Lang's address was a further elaboration with illustrations of the methods and results.

Two important points brought out by Mr. Lang were that the cost of underground single-phase distribution is not greater, and probably is less, than overhead; and that there have been practically no troubles or interruptions from lightning or other causes. Up to the present time about 150 cable miles have been placed in commission. The trench is dug 15 inches deep, either on the roadside or just inside the farmer's fence line—the farmer does not object to having the cable there and it is often easier to make a trench inside the fence than on the roadside. The cost per mile of installed cable is less than



(1) shows a 12,000 volt line above and a 4,000 4-wire line below. A 2,300 single-phase cable is taken off the pole at this point for underground distribution. On the pole is seen the choke coil, lightning arrester and fuse switch. (2) a 4-way branch; a 3-phase comes in underground and up the pole, where it is distributed in three directions, two of them 3-phase and one single phase; all by underground cable. (3) an overhead 110/220 distribution from the transformer which is fed by 2,300 underground (4) on the left, trees trimmed to accommodate Bell telephone line; on the right where the cable is run underground there is entire absence of mutilation. The same happy contrast is shown in the central figure.

$1000. The cable is enclosed in a lead sheath 1/16 inch thick; the cable itself varies from No. 6 to No. 1—mostly No. 6.

Location of Faults

Mr. Lang's address was chiefly a running comment on the illustrations as they were thrown on the screen, after which he invited free discussion. This dealt largely with the location of faults. Messrs. Smith, Rothwell, Caster and Rogers contributed, including descriptions of two different pieces of apparatus which had been designed and made up by the Commission's engineers, and by the use of which it was easily possible to locate trouble. The making of joints was also mentioned and the opinion seemed to prevail that, while it may take longer to locate an underground fault, the total time required to locate and mend a break would not be greater than on overhead lines and, of course, the number of underground repairs would be less than with overhead; for example, wind and sleet troubles are eliminated.

The Ontario Commission are sufficiently convinced of the efficiency of rural underground distribution that they have another 70 lines now under consideration.

Transformer Designing

By C. W. BAKER
Chief Engineer, Packard Electric Co. Limited, St. Catharines

Designing a transformer has been likened to making a lump of putty into a perfectly round ball—pressing in a bump at one side causes some other portion to bulge out. So it is with a transformer design; if we put in more copper to reduce the copper loss, the length of the magnetic circuit will be increased in order to surround the greater amount of copper—costs for copper and iron go up—core loss goes up, exciting current goes up, and probably the reactance will be altered, and, of course, the efficiencies are changed and possibly the transformer will no longer fit into the tank that the designer intended to use.

You Can Start the Design Almost Anywhere

Nearly all transformer designs are made by what we might call the "Experience Method" that is—the designer by virtue of his experience visualizes the approximate dimensions of the transformer which will meet the capacity and guarantees under consideration.

We may start almost anywhere. Let us choose say the mould dimensions as a starting point. The insulation and assembly allowances will determine the cross-section of the core within the coil.

From this core area, the frequency, and the chosen magnetic density, is determined the volts per turn, and, of course, the number of turns in the high voltage and low voltage windings.

The allowable current density in the copper determines the size of the high voltage and low voltage conductors. The designer then arranges them on the mould with appropriate insulation, cooling duct and winding allowances. He may then determine the lengths, resistances and weights of copper required for the windings: also the copper loss.

The coil dimensions and appropriate insulation and clearance allowances determine the size of the "window" or "opening" in the core. The chosen magnetic density in the yoke determines its sectional area and he can now determine the weight of core, core loss and exciting current; also the efficiencies, reactance and regulation.

If Guarantees Are All Met

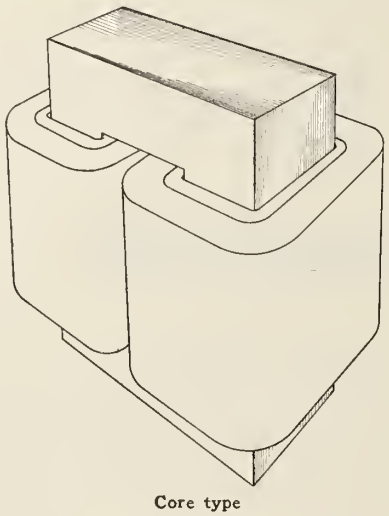
If the guarantees are all met and he has not spent too much money for copper and iron, he may proceed to design the end frames, lead supports, tank and bushings.

If he has fallen outside any of the guarantees, he must press in the design at this point, letting it bulge out at some other point where he has the best margin between the performance and the guarantees.

Systematic Methods of Design

These methods of design are based on equations correlating the effects that a change in any dimension will have on the other dimensions and properties of the transformer. They start with the current densities in the windings, insulation allowances, magnetic density in the portion of the core within the coils, the esti-

mated cost per pound of copper and iron in the transformer, including the labor to put it there, and the amount of waste material. This purports to give the cheapest design for the conditions chosen at the start, i.e. given current densities, magnetic densities, etc. They are excellent for estimating purposes or for a first design where there is no reference design available

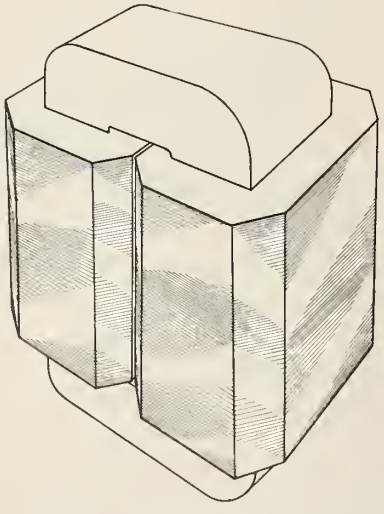


Core type

that is somewhat similar to the transformer desired.

Tall Tanks Economical

In general, a tall slim tank is less expensive, transformer and all considered, than a tank of more nearly cubical dimensions, since for the same contained volume a much larger tank surface is exposed to the air. Here the designer

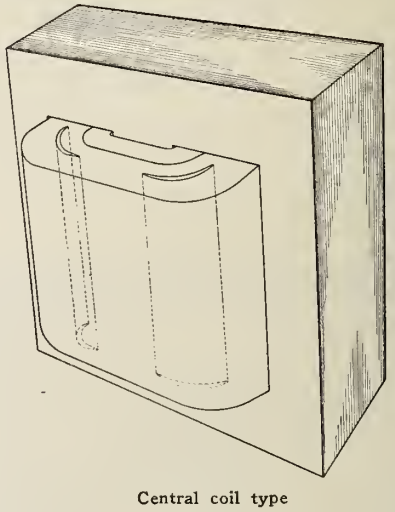


Shell type

balances his saving in cost of tank and oil against a possible increase in the cost of the transformer.

In general, a single conductor has higher eddy current losses than the same sectional area made up of several strands. A number of small conductors cost more than one large conductor and require more handling. They also take up more room, and space is valuable. The designer pays in manufacturing cost in reducing eddy current losses by stranding the conductors.

In general, cores built of thinner laminations give lower eddy current losses than when thicker ones are used, but surface oxide and core plate enamel take up valuable space, reducing the space factor and increasing the actual magnetic density in each lamination. Thus the gain in eddy current loss by using thinner laminations is offset by an increase in hysteresis



Central coil type

loss. Also the thinner laminations cost more per pound than the thicker ones.

Types of Distributing Transformers

There are four types of distributing transformers, the shell, the core, the central coil, and the multiple return magnetic path.

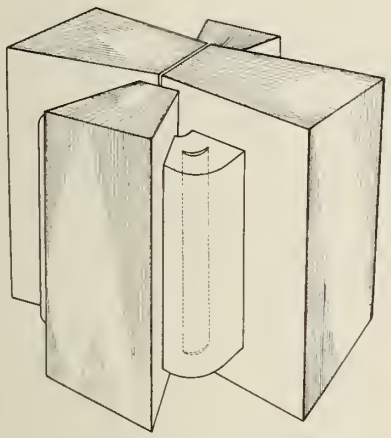
All the early distributing transformers were of the shell type design. As the coils are largely covered by the core and as cooling ducts in this type increase the length of the magnetic circuit, they were practically all superseded by the core type.

In the core type there is a large coil surface exposed to the oil and cooling ducts may be so arranged as not to increase the length of the magnetic circuit. This more efficient cooling of the copper gives far greater overload capacity than can be obtained in the shell type design. The majority of manufacturers are now using

the core type designs for their lines of distributing transformers.

The central coil design (with two return magnetic paths) is virtually the shell type design laid on its side with the core shortened so as to cover much less of the coil. This arrangement permits oil ducts to be placed in the ends of the coils giving efficient cooling without increasing the length of the magnetic circuit. Thus we have a combination of the better cooling of the core type with an approximation to the shorter magnetic path of the shell type. By increasing the sectional area of the outer legs of the core, the magnetic density is reduced, the core loss kept low and the exciting current is also low. These gains in performance are at the expense of an increase in the total weight of active material, which also means greater manufacturing costs.

In the multiple return magnetic path type, for the same weights of materials a still further reduction may be had in both the core loss and the exciting current, but these gains are at the



Multiple return type

expense of a more complicated design, more elaborate end frames, more expensive assembly, and greater difficulty of repairs. There is also a larger proportion of the coils covered by the core than in the other types.

Consumer and Designer

In the days when lighting was practically the only commercial use for electricity and the generators were shut down shortly after midnight and not started again till dusk, high core losses were of little significance; copper was cheap and copper losses were kept low. Under these conditions the maximum efficiency of the transformer is at a considerable overload, which, of course, was never reached for the art of loading transformers to the limit was not developed at that time; nor had high grade electrical sheet steel been developed.

As commercial uses for electricity developed, it became necessary to keep the circuits alive continuously and transformer core losses assumed a greater significance and the designer had to discard his former designs and make new ones to meet the new conditions.

Now the rate maker steps in and his influence appears in transformer designs. He now charges according to "demand" with a power factor clause containing penalties for low power factor. This stimulated a demand for transformers with very low exciting currents. This demand was greatly aggravated by attempts to operate 2200 volt transformers on 2300, or 2400 volt systems, which, of course, greatly increased their exciting currents, especially so on 25 cycle systems. To meet this demand designers are turning more and more to the central coil type.

To economize on poles a demand has arisen for lighter transformers; also that the center of mass of the transformer shall lie closer to the pole. The reduction in weight was largely accomplished by the development of the all steel tank. By squeezing the designs in one direction and permitting them to bulge in the other two directions, the center of mass has been brought much closer to the pole than in earlier designs.

To obtain low exciting currents the designer endeavours to have (a) his magnetic flux path as short as possible, (b) a large number of turns in the windings, to keep the magnet density low; also for the reason that a small current and many turns will produce a large magnetizing force, (c) the joints in the magnetic circuit should be, as far as possible, where the magnetic density is lowest, and (d) careful selection of his sheet steel.

For a time urban systems were buying larger and larger sizes of distributing transformers. They are now standardizing as far as possible in one or two sizes, which they buy in large numbers at very close prices. This standardization is of great benefit to all concerned. There is, of course, always the danger of carrying standardization too far into detail, and thus defeating its own ends by tying the hands of progress and development.

Delegates who Registered at the Orchard Point Inn During the A. M. E. U. Convention June 13, 14, 15

Barrie—J. S. Martin, J. H. Bennett, O. H. Lyon, John Hare.
Beamsville—G. W. Ostrander.
Beaverton—P. E. Byrne, P. McMillan, J. C. Burns.
Beeton—C J. Carlton, N. P. McDonald.
Belleville—Gerald A. Scott.
Brampton—J. W. Ostrander, John Speirs.
Brantford—C. E. Kirkby, W. R. Catton, Fred C. Harp, C. D. Anderson.
Brighton—R. O. Quick.
Campbellton—H. G. V. Farrer.
Cannington—J. E. Cornfoot.
Chatham—J. G. Jackson, B. L. Bedford, George W. Wands.
Clinton—H. B. Chant.
Collingwood—S. Burnside, E. J. Stapleton, Dr. Arthur, M. P. Byrnes, D. L. Daroch, W. A. Hogg, Will Hogg, H. E. Prentice
Dundas—W Wielley, A. A. Smith.
Elmira—H. O. Weichel, A. L. Ratz, David Hollinger.
Galt—R. Elliott.
Gravenhurst—V. F. Hunt.
Guelph—John J. Heeg, M. W. Wieler.
Hamilton—G. F. Moodie, W. B. Lewis, W. N. Elliott, Thomas F. Kelly, W. D. Booker, E. I. Sifton, W. H. Childs.
Hanover—J Hayne.
Hespeler—W. Logan.
Kitchener—A. R. Lang, C. Kranz, C. Doerr, D. Gross, V. S. McIntyre, H. L. Wilson.
Leamington—E. S. Frost.
Lindsay—W. E. Reesor.
London—A. M. Smith, G. W. Blay, Geo. Prudhomme, E. H. Carrothers.
Midland—S. J. Millikin, K. C. Millikin.
Mimico—Thos. E. Bell.
Napanee—C. A. Walters.
New Hambourg—Geo. Morley, L. Ritz.
New Toronto—Thos. M. Staunton, George Iron side, J. W. Cook.
Niagara Falls—J. W. Bayliss, J. E. Teckoe.
North Bay—R. H. Staford, T. M. Chamberlain.
Norwich—W. Daykin, W. Hooper.
Orillia—F. Gover, W. H. Tudhope, C. H. Hale, J. C. Miller, J. P. Downey, R. H. Starr, A. H. Huffman, Geo. Page
Oshawa—A T. Hicks, Geo. F. Shreve
Ottawa—G. E. Pennock.
Peterboro—William G. Ferguson, H. O. Fisk, F. S. Schneider.
Petrolia—G. W. Currie.
Port Credit—R. M. Parkinson.
St. Catharines—G. McFarlane, W. Mackenzie, A. G. Knapp, N. E. Wheeler, C. Baker, C. W. Spratt.
St. Marys—C. R. Cole
Sarnia—J. E. B. Phelps.
Stamford—(L W P) L. L. Craig, Geo. Rysdale.
Stratford—J. Swanson, R. H. Myers, E. W. Tobin.
Strathroy—E. R. Smithrim
Sudbury—R. H. Martindale.
Tillsonburg—S. Buckrell, C. H. Denton, A. S. Rennie.
Toronto—L. G. Ireland, D. T. Flannery, S. B. Iler, R. M. Love, H. Ebert, W. P. Dobson, F. Peasnell, A. G. Hall, C. H. Keeling, A. W. Murdock, C. T. Barnes, N. R. Kirby, J. B. Andrew, N. J. Lake, N. B. Kemp, R. J. Roche, E. G. Flowers, G. E. Jaquet, G. Emeler, C. W. Moat, F. T. Stocking, G. Clarke, H. C. Budd, R. H. Mortimer, J. A. Bartlette, W. Moser, C. H. Hopper, F. S. Babcock, George Frame, Wills Maclachlan, T. A. Mahony, H. H. Couzens, S. L. B. Lines, J. R. Longstaffe, Walter Carr, S. S. Bain, J. W. Purcell, R. M. Bond, A. C. McBride, B. Faichney, J. F. Paxton, R. T. Jeffery, N. D. Kribs, H. C. Don Carlos, M. B. Hastings, N. E. Radford, A. Schofield, A. S. McCordick, J. C. Halcombe, J. P. Morgan, H. C. Barber, S. M. Richardson, G. Pace, W. D. Corcoran, Chas. H. Lee, R. N. Scrivener, C. W. Burns, J. Keyes, Geo. W. Paterson, A. H. W. Joyner, J. H. Heydon, C. G. Brandt, Jas. R. Smith, E. F. Hinch, R. A. Fraser, I. W. Beverly, G. J. Mickler, G .W. Lawrence, L. I. Playfair, A. Lloyd, H. E. Doty, W. O'Hearn, D. Flemming, A. W. J. Stewart, D. G. Mackay, P. H. Fox, A. E. Wilson, Dan. M. Sutherland, A. N. Brooks, W. N. McCarney, C. Barthe, H. A. Owens, W. E. Young, Thos. A. Gass, W. Greenshields, D. G. Mackay, H. S. Shannon, F. Miles, A. B. Cooper, Geo. B. Cooper, Geo. P. Eaton, Geo. D. Leacock, A. J. Magley, W. E. G. Robertson, W. Bonyer, C. T. Rutland, H. T. Gibb, Joseph Showalter, R. M. McKenzie, J. D. Pace, R. C. McCollum, J. H. Caster, H. D. Rothwell, J. J. Jeffrey, E. R. Lawler, C. W. Richardson, D. McAuley, R. Bergh, H. J. Surtees, B. Mulholland, A. G. Lang, R. E. Jones, S. R. A. Clement, W. F. Wright.
Trenton—F. C. Adsett.
Tweed—A. H. Lloyd.
Walkerville—M. J. McHenry, Wm. Lowry.
Waterford—T. C. Savage, J. R. Forbes, W. Woodley, James Ross.
Waterloo—Geo. Grosz.
Windsor—F. D. Hubbell, W. E. Wallace.

The "Old Timers" who Fore-gathered to the Number of Three Hundred and Twenty, Mount Royal Hotel, June 21-2-3

Montreal—J. York, W. H. Winter, D. E. Blair, F. B. Brown, A. L. H. Jones, J. A. Shaw, F. Thompson, J. D. Lachapelle, J. W. Pilcher, J. C. Hyde, A. J. F. Montabone, A. Parent, E. W. Sayer, L. V. Webber, C. F. Medbury, J. B. Woodyatt, W. B. Shaw, A. S. Tait, M. K. Pike, C. F. R. Jones, T. A. Farell, W. Hinks, A. R. Richards, W. R. Hilton, R. J. Hiller, J. M. Walkley, J. M. Robertson, G. C. Rough, H. B. Irving, I. Smith, D. C. Meloon, G. A. Templeman, P. Lahee, A. Powell, S. W. Smith, A. Schwartz, C. Johnstone, L. C. Haskell, G. R. Atchison, F. T. Kaelin, S. Aspinall, C. E. Barrett, R. J. Beaumont, C. Doutre, F. D. Baker, J. S. H. Wurtele, J. H. Trimingham, O. E. Stanton, D. H. Ross, J. H. Chennell, The Gazette, Wm. Smythe, Geo. Issman, H. E. O. Bull, H. H. Vroom, J. J. Sorber, A. H. Pattenden, J. O. G. Cann, L. S. Page, E. W. Playford, H. L. Etienne, J. N. Mochon, H. L. Cook, J. W. Hughes, A. A. Giddings, J. G. Bryson, R. H. Mainer, L. B. McFarlane, P. A. McFarlane, C. L. Glasgow, R. W. Barclay, L. E. Dubuc, E. C. McGovern, J. S. Norris, His Worship Mayor Martin, J. R. Cox, H. B. Pope, E. J. Turley, Ernest Craig, W. P. O'Brien, R. S. Kelsch, G. T. Higgins, S. E. File, L. B. Temple, C. S. Bagg, C. M. Tait, J. J. Warren, Frank Sackman, W. McCron, W. A. Walker, J. A. Hicks, F. H. Stacy, W. Wilson, J. A. Burns, R. Moncel, L. A. Mace, W. G. Gibson, J. A. Jamieson, P. T. Davies, L. J. Belnap, P. R. Hanson, W. M. Hall, N. W. Van Wyck, R. H. Balfour, J. Alan Fletcher, W. P. Roper, W. D. Bishop, F. J. Parsons, E. S. McNab, D. W. Massie, K. B. Thornton, R. M. Wilson, J. B. Tullo, H. G. Schrck, A. J. Westman, L. H. Marotte, C. Thomson, N. C. Mills, J. A. Fleet, E. B. Walker, W. A. Christie, N. J. Engel, J. J. Dougherty, W. J. Francis, A. Dupuis, L. Beauchamp, G. A. Wendt, W. D. Pilcher, J. H. Allan, E. D. Clements, O. L. Whittet, B. L. Phelan, E. J. Salisbury, R. D. S. Neill, C. B. Coulson, G. Therrien, J. C. Armour, A. Decary, F. W. Jacobs, D. M. Jones, R. Carvey, W. Northey, R. Lyons, A. C. Tagge, C. P. Warhaus, J. Rosenthal, H. M. Jennings, B. Champagne, R. Dumont, A. R. Bouchard, J. C. Gariepy, F. Guillevin, F. Lamasse, L. D. Pontbriand, Louis Kon, A. Brown, T. H. Letts, G. C. L. Brassart, R. McGregor, S. Cunha, L. J. Edouard, R. J. Dowd, L. J. Gibbons, E. Dey, C. Laplante, J. V. Gauthier, F. Rioux, H. S. Carr, V. J. O'Connell, J. A. Guilbault, J. A. Dick, G. Primeau, J. G. Gravelle, J. E. Leroux, A. G. Racey, Montreal Star, J. J. Shea, J. Drouin, A. Kempton, L. Legrove, H. McDonald, T. A. Callaghan, J. H. Perreault, T. Tait, F. Powell, R. P. Hudson, J. H. Seguin, D. A. McGuire, R. E. Harel, R. Sutherland, J. C. Shirreffs, P. Riopel, C. Jarvis, J. Grenien, L. Pratte, E. Mausette, J. Jackson, B. W. Moncur, A. A. Norris, S. Davis, H. B. Fisk, L. Grant, F. G. Sherrington, H. W. Weller, H. A. Budden, T. R. Fulton, J. A. Gibson, G. N. Clarke, E. Holder, J. E. Scott, H. Elliott, W. Y. Porter, G. W. Thompson, (Westmount).

Toronto—T. S. Young, J. Wilson, G. D. Leacock, W. A. Bucke, P. A. Hinds, W. Maclachlan, C. N. Winton, G. S. Stewart, G. B. Wilson, A. S. Edgar, W. J. Burt, C. H. Keeling, J. J. Ashworth, C. S. Mallet, W. J. Sweetman, A. B. Cooper, W. R. Carr, S. E. M. Henderson, J. A. Bremner, E. I. Jenking, G. W. Watts, A. F. Wilkes, R. M. Love, H. R. Johns, S. L. B. Lines.

Chicago, Ill.—F. N. Jennings.

Smith's Falls, Ont.—J. S. Gould.

Hamilton, Ont.—T. F. Kelly, N. S. Braden, E. Loss, P. J. Myler, L. W. Pratt.

Drummondsville—F. A. Chisholm.

St. Hyacinthe—E. St. Onge.

St. Catharines, Ont.—R. A. Stinson, F. T. Wyman, F. Garner.

Quebec—Lewis Burran, A. P. Doddridge, E. A. Evans, G. H. Simpson, W. J. Lynch, R. B. McDunnough, C. W. McMillan.

Peterboro—E. G. Patterson, R. E. Layfield, A. G. Grier, H. O. Fisk.

Levis—J. B. Dorais, H. E. Weyman.

Niagara Falls—A. M. Grier, W. P. Little, E. W. Longbridge, M. W. Many.

St. John, N.B.—H. M. Hopper, H. A. Brown.

Ottawa—J. Murphy, O. Higman, D. P. Burke, W. Y. Soper, T. Ahearn, Col. D. R. Street, A. A. Dion, W. J. McGowan.

Hartford, Conn.—C. H. Abbott.

Verdun, Que.—E. Smethurst.

Halifax, N.S.—W. M. Bristol.

Valleyfield, P.Q.—J. Lyth, J. S. Marchand.

Hawkesbury—J. Ross.

Three Rivers, P.Q.—J. H. Crossley, G. M. Anderson, J. H. Warren.

Schenectady, N.Y.—G. L. Alexander.

Sherbrooke, P.Q.—W. J. Wiggett.

Montmagny, P.Q.—L. Rousseau.

Winnipeg.—W. H. Reynolds.

Shawinigan Falls, P.Q.—T. J. Mullen.

St. Hilaire—M. L. Shea.

Hull, P.Q.—A. V. Gale.

Rock Island—B. Faraday.

Granby, P.Q.—J. R. Gregoire.

Ste. Cesaire—J. A. Page.

Brantford—C. D. Hudson.

Oshawa—A. T. Hicks.

Richmond—J. W. Harker.

Campbellton, N.B.—H. G. V. Farre.

Private Central Station Companies Also Hold Record Gathering

For the Thirty-third Time the C. E. A. Demonstrates its Value to the Electrical Industry—Marked Progress Reported in Engineering, Accounts and Merchandising

The annual convention of the Canadian Electrical Association, held in the Mount Royal Hotel, Montreal, on June 21, 22 and 23, was the 33rd convention of that Association, and was one of the best, if not the best, that the Association has ever held. There were in the neighborhod of 250 delegates.

Special features were the very complete and valuable reports of the various committees which have been organized along lines very similar to the National Electric Light Association. The reading of these papers and the discussions that followed in a number of cases afforded a great quantity of practical information that it is not possible to get elsewhere than at a convention of this sort. The evident weakness of the program was the impossibility of covering all the ground in the limited time allotted, thus tending to curtail the discussions of the members who, generally speaking, are too diffident about expressing their opinions. If more time could be given to the disscussion of each report it would be possible to work up more enthusiasm and induce a larger number of members to express their opinions and experiences.

One also heard the suggestion that some of the most excellent papers were introduced very briefly by the authors in an evident endeavour to save time, while others discoursed at much greater length. It would be a good idea, we believe, if each author were to prepare a 500-word, or less, synopsis of his paper, which he would read before the convention, dwelling briefly on the most important points and raising the questions that would most likely be fruitful of discussion.

The Luncheon

The midday luncheons and Thursday evening dinner were also important features of the convention. The delegates gathered in great numbers and in addition to excellent addresses enjoyed some interesting social hours. At Thursday's luncheon, over which Mr. P. T. Davies, the president of the association, presided, Mr. F. M. Feiker of the Society for Electrical Development, was the speaker; Mr. Feiker will be remembered as a former editor of the "Electrical World." At this luncheon a musical entertainment was provided by Mr. F. T. McKean with Mr. J. W. Walkley, prominent contractor-dealer of Montreal, acting as accompanist. At the Friday luncheon Mr. Monro Grier presided and Mr. W. H. Johnson, president of the National Electric Light Association



Mr. P. T. Davies, re-elected president

and Mr. L. A. Hawkins, Engineer Research Laboratories, G. E. Co., were the speakers.

At the Thursday evening banquet, Mr. Davies again presiding, Mr. J. W. Gilchrist, vice-president of the Chicago Commonwealth Edison Co., and Rev. Dr. G. R. Allan, were the speakers. Mr. Walkley again accompanied the soloists. This banquet was followed by an informal dance.

Decorations

The decorative features at the Thursday evening banquet were entirely unusual and very clever. These were in charge of Mr. A. Lee

H. Jones. At the entrance to the banquet hall the delegates were greeted by a quite wonderful sign which read in large letters traced out by small electric lamps in varied colors,—C.E.A. Between the "C" and the "E" and the "E" and the "A" were entwined the Canadian and U. S. flags. The most attractive feature of the sign, which was about 4 ft. in length, was that it was solidly encased in a block of ice some 5 ft. long, 2 ft. high and 1 ft. thick.

Another stunt that attracted much interest was the utilization of a number of 1000 candle power nitrogen lamps as gold fish ponds where the visitor saw the unusual spectacle of a number of gold fish swimming around in these large bowls. In close proximity to these two attractions Mr. Jones had placed a statue of Canada's "First Engineers."

The lighting on the dining tables was of unique design and the tables themselves were so placed as to trace the three large letters—C.E.A.

The event which had perhaps been looked forward to with greatest interest and will be looked back upon with very kindly recollections, was the reunion of electricial veterans on Friday evening. Too much cannot be said in praise of Mr. J. W. Pilcher who conceived and carried out the idea, and Mr. Geo. C. Rough, his able lieutenant and coworker. Working with Messrs. Pilcher and Rough were a committee composed of D. E. Blair, Cecil Doutre, Dr. L. A. Herdt, Chas. F. Medbury, M. K. Pike, Julian C. Smith, Fred Thompson, K. B. Thornton, R. M. Wilson, W. H. Winter. Further details of this evening are given on another page.

President Davies' Address

In reviewing the work done for the past year as is customary in a President's address, I feel that whatever we have accomplished, that there has been no lack of effort on the part of your executive to attend promptly to all matters to which its attention has been directed.

There has been general criticism of the association in past years, from our manufacturing members and others, that the association has confined itself too much to technical details of operation with some discussion from time to time of problems of management.

Your association this year therefore endeavored to assist as far as possible the other branches of work, feeling that the technical section can well be left alone. As a result, a very strong committee was formed to look more closely into commercial matters and it is our belief that the work of this Commercial Section will be quite noticeable both in the excellent advance reports which we have from the various sub-committees; also from the list of speakers whom they have obtained to address our sessions.

Your executive also has assisted Mr. Paxton Little to build up the activities of the Accounting Section. The presence of Mr. Edwards today who is known perhaps as the premier public accountant in the world, is just one evidence of their ability to progress.

It is unfortunate that we have to have parallel sessions and that out accounting section will sit concurrently with other sessions this afternoon, but I hope that we will have a very complete attendance of at least all men interested in public utility accounting in Montreal, at these sessions and I believe that some of our executive officers will find it very much to their advantage to listen in at their meeting this afternoon.

We have endeavored also to find some room for and give some attention to our friends the contractor-dealers. Our Local Section in Montreal held a number of meetings in the winter at which contractor-dealers were privileged to be present. The members of your association also make up a directing force in the various provincial co-operative associations. The C.E.A. is only too willing and glad to be of greatest assistance possible to all men who are in the great electric business.

Work Accomplished

Various special matters came up for attention and I will here briefly refer to some of them.

In the Fall of 1922, when our member companies in Ontario were in danger of having their water power rights restricted in an arbitrary way, through a Bill No. 249, which was before the Ontario Legislature, energetic representations were made both through the usual legal channels and also by means of our particularly persuasive past president, Mr. Monro Grier. It is with pleasure that the association can report that the objectionable clauses to the Bill were removed.

Our association had its attention drawn to the index finger in the Cost of Living table which was quite unfair to the electric light and power companies, inasmuch as the item "heating" was combined with the item "lighting" in all tables. Representations have been made and

comprehensive data gathered, whereby the Minister of Trade and Commerce was enabled to separate out the item lighting from heating, so that in future instead of this item showing apparently that lighting in 1923 is 188% of 1914 prices, it will show a decrease in the average cost of lighting per family during this period. Our last advice from the Minister, is that he has all the information necessary, that his Statistical Department is working on the average figures and that it is their attention to make the change in some form or other at an early date.

Meter Seal Term

Our Committee on Meter Seal Extension, of which I am chairman, has a blank year to report; representations have not met with the reception that your association feels is due to them, but inasmuch as the truth finally must come out, I believe that it is only a matter of time until our very just desires in the matter of meter seal extension are met by the government.

Insurance Premium Reductions

Following along the lines of the wonderful work done by the Insurance Committee of the N.E.L.A. by which fire insurance premiums have been reduced on an average by 25%, we appointed a strong committee to investigate the premiums paid in Canada in comparison with the property losses. This committee will make its first official report at our Class A. meeting on Saturday morning, and without anticipating this report I might state that the findings are as expected and that there is ample room for a very large reduction of the fire insurance premiums which your member companies have been paying. Class A. members are earnestly requested to attend our meeting on Saturday morning, as your committee feel that they should have some direction with regard to further steps which should be taken to make effective the recommendations of our Insurance Committee.

Resuscitation Medals

The association was called upon to make the first presentation of one of the medals for resuscitation by the prone pressure method, available under the Julian C. Smith foundation. It was particularly pleasing to the Canadian Electrical Association that the first award should be made to an employee of a utility outside of our ranks. The second, which will be made during the course of the convention, is also to be made to another employee of the Hydro-electric system of Ontario. We feel that nothing but good can come of our marching together along the lines of humanity with all progressive forces, even if we are unable to see eye to eye with them in regard to their indifference to the policy of private ownership.

Ontario Hydro Matters

Various appeals were sent to both individuals of member-companies and your executives to attend some of the sittings of the Gregory Commission, with a view to presenting evidence. Your association, while insistent upon guarding the rights of its own member-companies to live and fill a legitimate and protected place in our modern social structure, is quite satisfied that time alone will show to the owner of property in Ontario, and also to the people at large, the economic impossibility of operating for any length of time those necessities which history has again and again proved can only be run by private agents. The association does feel that it is unfair for any government body such as the Hydro-electric Power Commission of Ontario, to escape the payment of the normal taxes incident to the operation of such a system by private ownership. The fact that the Hydro-electric Power Commission in its operation pays neither income tax to the government of the country, or any provincial taxes whatsoever, is benefitting the few customers in Ontario at the expense of not only the non-users in Ontario but also every other person in the Dominion of Canada. When this freedom from taxation is carried to the limit that the Hydro-electric System pays no sales taxation on the appliances which it buys for resale, a legitimate ground for criticism is present among those dealers in Ontario who have to sell in competition with such merchandising outlets.

In February of this year, the Income Tax department of the Dominion Government, planned to treat bond interest as a profit and not as an expense. Your association immediately gathered together opinions from member companies and added their representations to others, which finally had the effect of, for the time being at any rate, disallowing this suggested interpretation.

In answer to several requests, a list has been prepared, showing the rates of wages paid for different electrical occupations in different parts of Canada; this list is on file at the office of the association where reference to it can be had at any time.

Your Association has had numerous calls

upon it to appoint members to act on various committees on matters affecting the industry. Appointments have been made of those members who have been available for such duties and your association feels that they are very well represented in all matters that affect the interest of public utility companies.

World Water Power Conference

The Dominion Government is taking an active participation in the World Water Power Conference, taking place in June 1924. Your association was called upon to assist in these matters and out of five papers which are to be presented at the exhibition in connection with the exhibit, three of them are to be prepared under the guidance of three of your members as follows:—

Transmission and distribution of electric energy.—By Julian C. Smith, working in co-operation with other engineers to be chosen by himself.

The application of Hydro-electric energy for Public Utility purposes.—By P. T. Davies, acting in co-operation with other engineers.

The financial aspect of power development in Canada.—By Sir Herbert Holt.

The association feels very much honored in this choice and trusts that all requests for information from these gentlemen will be readily given to the best of the ability of our member companies. It is essential that the reports on the above very important matters should be complete and authoritative.

In conclusion, the vice-president and myself want to record our personal appreciation of the support which has been given us both by our Secretary, Mr. Kon, our treasurer, Mr. C. Johnstone, who have carried their load of work cheerfully at all times, and also of the chairmen of our four main sections and of different men who have worked unceasingly to complete their reports, which we now have before us.

John Pilcher's Party, or— The Veterans' Reunion

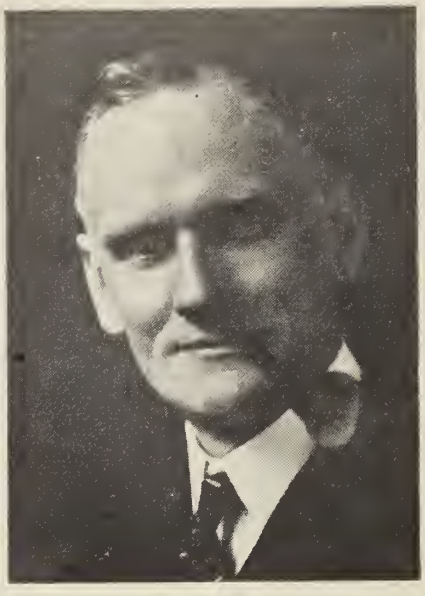
The big event for which the veterans had waited impatiently arrived on Friday evening. By eight o'clock "Salle Doree" of the Mount Royal Hotel was a seething, howling mass of friendly humanity. Some doubt had been expressed as to the possibility of getting together a sufficiently large number of 20-year-old "veterans," but the 300 odd old timers who crowded into the hall left no doubt of the enthusiasm with which they had received the suggestion of a reunion. The names of those who had registered and received buttons for this event are given below. Unfortunately a few of them were unable to be present and a number of interesting telegrams and letters were read by Mr. Pilcher. These merely added fuel to the enthusiasm, however, as the old names were read out and their good wishes for a happy reunion passed along to the delegates.

Too much cannot be said in appreciation of the splendid work of Mr. J. W. Pilcher in conceiving, organizing and carrying through this successful evening. He was ably assisted by Mr. Geo. C. Rough who relieved Mr. Pilcher at times as chairman of the meeting and, in his turn, delighted the veterans with a selection from Drummond, a favourite with Mr. Rough as well as it evidently was with the audience. Mr. A. Munro Grier recited that well known piece from Kipling entitled "If." Mr. Grier had to leave early in the evening to catch his boat for England, where he is spending some months, but he did not fail to take his part, as usual, in any event associated with the welfare of the Canadian Electrical Association.

One of the oldest veterans present—perhaps the oldest in active business—was Mr. Fred Thomson of Fred Thomson & Son, Montreal, who has 49 years' service in the electrical industry to his credit. That means that Mr. Thomson joined the electrical industry in 1874, at a time when it could scarcely be considered as having any existence and certainly when few had foresight and courage enough to think of making it their life's study and work. Mr. Thomson gave some interesting reminiscences of his earliest efforts at stringing wires and lighting isolated buildings electrically. In spite of his years he is active and vigorous and there was no one in the hall who did not wish him



Mr. A. Munro Grier, the orator of the Electrical Industry



Mr. John W. Pilcher, who conceived, organized and carried through the Veterans' Reunion



Mr. Geo. C. Rough, John's first lieutenant, genial always

many years of continued usefulness and prosperity.

Mr. Ormond Higman has the honor of being associated with the industry longer than any other veteran. Mr. Higman's activities in Ottawa are well known, as is also his phenomenal physical and mental vigor after 60 years of service. Earlier in the day Mr. Higman had taken part in a discussion in the convention hall on the question of lengthening the meter test period. His clear grasp of the situation and his logical fair-minded viewpoint had been commented upon by the delegates.

Mr. L. B. McFarlane, president of the Bell Telephone Co., claims an association of almost 58 years in the electrical service of his country. Mr. McFarlane, too, is still vigorous, but contented himself with bowing his appreciation of the ovation the mention of his name received.

Another veteran was Mr. W. B. Shaw of Montreal, who is still hale and vigorous and one of the most interested participants in the veteran reunion.

Special mention was made of Louis Burran who, after 45 years' service has resigned and, at the hour of reunion, was enjoying a sea voyage which will land him in England where he expects to spend the summer. Mr. W. H. Winter, plant superintendent of the Bell Telephone Co., has only been associated with the electrical industry for 38 years but he was kind enough to relate a few of the experiences of that short period. E. W. Sayer, 33 years in the industry, and now in addition to his prominent contracting business, a valuable member of the Quebec legislature, contributed a story to the program. A. P. Doddridge, 39 years with the Quebec Railway Light, Heat and Power Co., must, to judge by his appearance, have started in at about 5 years of age. Edward A. Evans of Quebec was unable to be present. Paul J. Myler, with 40 years' service to his credit, also expressed his regret by telegram. John Murphy of Ottawa, 39 years, attended both the convention meetings and the reunion; so did L. V. Webber, 35 years. A. A. Dion was active and helpful as ever; J. W. Pilcher himself claims 35 years' association and Geo. D. Leacock, though, as he says himself, he doesn't look a day over 25, was down on the list with 28 years' service. J. J. Ashworth, 33 years, was unavoidably absent, but C. S. Mallet, W. A. Bucke and E. I. Jenking, three other C. G. E. veterans, were present. N. S. Braden and L. W. Pratt were missing,—and missed. R. M. Wilson was a quiet spectator; so also was H. O. Fisk of Peterboro and K. B. Thornton.

The complete list printed elsewhere will be studied with real interest.

Mr. Pilcher had prepared a very interesting program in addition to the items already mentioned which included a number of improvised topical verses referring to well known characters, and set to popular airs. Everybody knew



This is the C.E.A. Convention of 1895 held in Lorne Park. Do you recognize any of them? Write the editor and let's see if we can identify them all

the tunes and the words were projected by lantern on the screen.

One particularly clever item on the program was designed to illustrate the wonderful contrast between the early ages of darkness and the modern age of the mazda lamp. The scene was excellently executed.

An item that must have appealed particularly to those associated with the industry in the early days was the presentation of the Julian C. Smith life saving medal to an employee of the Montreal Light, Heat & Power Company, Mr. Albert Senecal. We have made great strides in the electrical industry and the need for safeguarding life has grown with the years. So much experimental work has been done that it is now pretty generally recognized that the prone pressure method is most effective. In the case under consideration there seems to be no doubt whatever that without Mr. Senecal's assistance a boy's life would have been lost. After receiving the electric shock he had been taken into the police station and was supposed dead when Mr. Senecal who had seen the prone pressure method of resusitation used on different occasions and had had one or two lessons in it, started in immediately to see if the boy could not be revived. After working for a full half hour the first signs of life appeared. Dr. Campeau states in connection with this incident "I am perfectly satisfied that the work of Mr. Senecal was the means of saving the boy's life, as I only injected a stimulant some 30 minutes after the accident had actually happened and at this time the boy showed signs of reviving." The medal was presented by President Davies in the absence of Mr. Smith. Mr. Davies drew particular attention to the fact that while it is frequently difficult to say definitely that victims would not have revived without recourse to resusitation, we here had a case that seemed to demonstrate beyond all doubt that a life had actually been saved.

Mr. Wills Maclachlan estimates that the loss of a workman, in dollars and cents, costs the electrical industry about $8,500. He pointed out that the Julian C. Smith medal had already been presented three times within the last six months, which means that three times $8500 had been saved to the industry—quite outside of sentimental reasons for continuing this work.

During the evening sandwiches, cheese and biscuits, and light beer were served. From time to time short intermissions were given for the veterans to move around and exchange "How d' ye do's" and hand shakes.

At 11:30 it was all over. Most of the Ontario men left by the midnight train except those who remained over for a day's golf, and the 1923 convention and reunion of the C.E.A. goes down as the most successful in history.

The 1923 report of the Prime Movers Committee of the National Electric Light Association deals with stacks and flues, higher steam pressures and temperatures, station piping, coal and ash handling, and power station heat balance.

Report of the Committee on Public Relations

Customer Ownership a Live Issue in the United States and Making Headway in Province of Quebec

By J. B. WOODYATT, chairman

Last year you will remember that after studying the work of this committee of the N.E. L.A., and the methods whereby it could be applied to our own association, your chairman reluctantly came to the conclusion that our Canadian situation did not permit of the centralization of this work on our side of the line, and that on account of the dissimilarity of local situations and impracticability of frequent meetings, it was felt that more could be accomplished by the organization of local groups than through a central committee.

The situation in this respect has not been altered, but the importance of maintenance of proper relations with the public served is greater than ever, and the organization of local groups to carry on the work of improving and maintaining the relations between the public and the industry is again, and strongly, urged.

This work on the other side of the line has been divided up, and I know of no better way of pointing out the importance and scope of the work in hand, than by repeating the objects of the various subdivisions:

1. **Women's Public Information Committee:** To formulate and put into effect plans for the education of women of the country on the fundamental economic principles of the electric light and power business and the interdependence of the public and the industry;

2. **Employee Relations with the Public Committee:** To foster, through the executives of member companies the proper education of employees in the fundamental economic principles of the light and power business, in the proper understanding of the inter-relation of the public and the industry, and in the proper handling of complaints and courtesy to the public;

3. **Public Speaking Committee:** To organize through the geographic divisions, a bureau of public speakers, national in its scope, and dealing with subjects pertaining to the electric light and power industry.

4. **Relations with Bankers' Committee:** To have general supervision of all co-operative work and investment bankers, bankers, insurance companies, etc.

5. **Manufacturers' Advertising Committee:** To induce the large advertisers amongst those interested in the manufacture of electrical materials, as well as those interested in the purchasing and handling of public utility securities



Delegates of the 33rd Annual Convention of the Canadian Electrical Associ

to devote a part of their appropriations to the spreading of proper information concerning the fundamental economic principles of the electric light and power businesses, and the interdependence of the public and the industry—in addition to committees on local organization of public information, and on uniformity of local regulatory laws;

6. Co-operation with Educational Institutions Committee: Organize public utility schools and university courses;

7. Information Bureau, Organization Committee: To organize, through the geographic divisions, committees on public utility information.

Proper public relations can only follow satisfactory relations between the Company and its customers, and to assist in promoting the latter the following service suggestions were issued during the past year:

Identification and appearance of meter readers;
Educating employees in the proper use of electrical appliances;
Plans for reporting complaints and submitting suggestions for betterment of service;
The business of your company is to render service and courtesy to the public;
Proper location for meters;
Telephone orders for better service;
Improving service rendered to outlying communities;
The practice of disconnecting and reconnecting meters in the New York and Queens Electric Light & Power Company;
and our member companies are urged to give these suggestions their consideration.

Customer Ownership

As reported last year, it was felt that the ownership of the securities of the companies by their customers, and the education of the public necessary to bring about this ownership, was probably the greatest single factor in the betterment of relations between the public and the company, and your chairman is still more than ever convinced of this, and that our member companies should use their greatest endeavours to promote the policy of customer ownership in their respective fields.

The movement is going ahead by leaps and bounds. 156 companies reporting to the N.E. L.A. Committee on Customer Ownership show the following:

SUMMARY BY YEARS

Year	Shares of Stock Sold	Stockholders Obtained
1914	92,310	4,044
1915	57,103	4,357
1916	38,057	3,681
1917	79,348	7,470
1918	30,783	4,115
1919	166,096	20,840
1920	416,089	62,885
1921	802,845	118,177
1922	1,750,707	198,018
	3,433,338	423,587

Stated in par value of $100 per share

The increase in 1922 over 1921 is most marked and gratifying.

Advantages of this Policy

In the State of California the advantages of this policy were recently put to a severe test. The California companies have made remarkable progress in promoting customer ownership, so that today a great percentage of their customers are shareholders. The Southern Cali-



Many well known faces are seen. The Convention was a wonderful success

fornia Edison Company have over 50,000 shareholders amongst their 200,000 customers, the Pacific Gas and Electric Company have 30,000 shareholders amongst their 700,000 customers, and the smaller companies have made equally good showings, so that when the Government of the State proposed to raise a fund of five hundred million dollars with which to go into the power business, the plan was defeated at the polls by a vote of over four to one; and an analysis of the votes against the plan in the individual municipalities showed that they were directly proportional to, and almost directly traceable to, the customer owners of the various companies.

Southern Canada Power Co's Experience

The company with which the chairman is connected took the plunge last fall, and as a result practically 10% of the customers of this company have now a financial interest in the success of the company; and the first effort will be shortly followed by another one, and then others, until such time as the greater number of the community served are financially interested in the company serving them. The Southern California Edison Company in the west, and the Central Maine Power Company in the east, both have something over 25% of their customers as shareholders, and it seems hardly necessary to point out the advantages accruing both to the company, its shareholders, and its customers, when every fourth customer is financially interested in the success of the company, and there should be no let-up in our endeavours until this percentage thus known to be possible of attainment is reached in our own respective districts.

The policy of customer ownership has not as yet made any great headway in this country, but the time is ripe and much can be done during the coming year, and we would again strongly recommend that the matter of organizing a campaign for the sale of securities to its customers be given consideration at the earliest opportunity by each member company. Improvement of relations between the public and the company in any locality is bound to have a beneficial effect in other localities, so that anything that is done by a member company will not only greatly improve its own position, but also improve the general situation to the benefit of the entire industry.

The New Executive Committee

President: P. T. Davies, Southern Canada Power Co.

Vice-presidents: R. J. Beaumont, Shawinigan Water & Power Co; W. Paxton Little, Canadian Niagara Power Co; J. B. Woodyatt, Southern Canada Power Co.

Treasurer, C. Johnstone, Southern Canada Power Co.

Secretary, Louis Kon, Room 311 Power Bldg., Montreal, Que.

Members

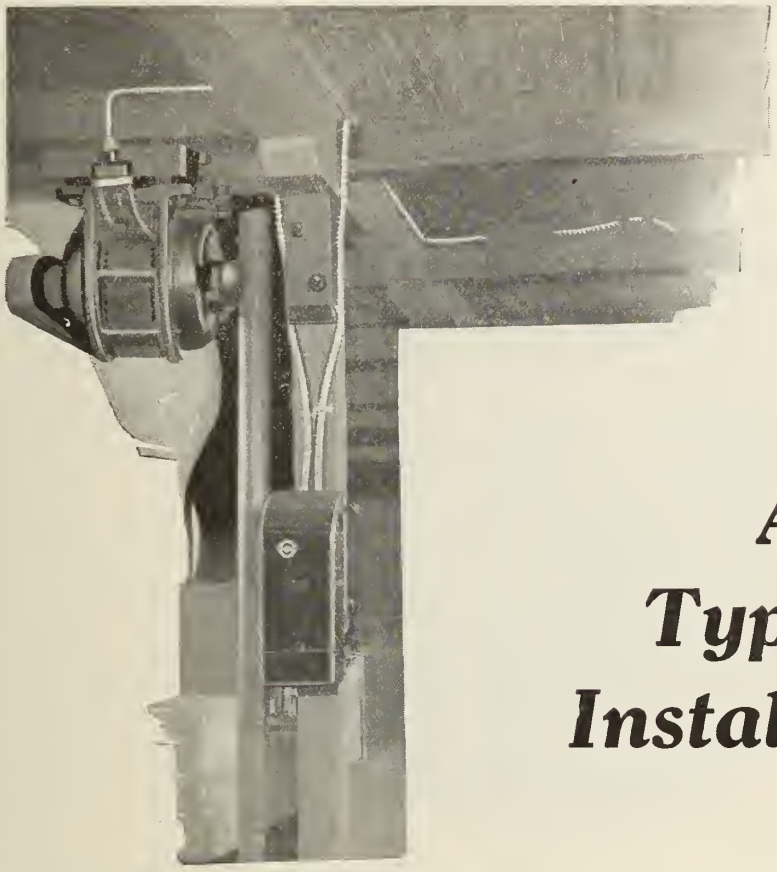
N. S. Braden, Can. Westinghouse Co.; W. A. Bucke, Can. Gen. Electric Co.; A. B. Cooper, Ferranti Meter & Transformer Co.; A. A. Dion, Ottawa Electric Co.; A. P. Doddridge, Quebec Railway, Light, Heat and Power Co.; A. Munro Grier, K.C., Canadian Niagara Power Co..; W. O'Brien, Montreal Light, Heat & Power Con.; M. K. Pike, Northern Electric Co.; M. A. Pooler, New Brunswick Power Co.; J. C. Smith, Shawinigan Water & Power Co.; J. E. Tanguay, Quebec Public Service Corporation; W. H. Winter, Bell Telephone Co.; The president, National Electric Light Association, N. Y.

Advisory Committee: Past presidents eligible for office.

Contracts Let for Quinze River Development

Announcement is made that the contract for the entire electric equipment required in connection with the hydro-electric development on the Quinze River will be supplied by the Swedish General Electric Company. The generators are virtually duplicates of those supplied by this company some time ago to the Swedish government for installation in the now famous Trollhattan power station. The initial installation at Quinze River will contain two units of 10,000 kv.a capacity. Power will be 25 cycle, 11,000 volt; the generators are vertical type and will have direct connected exciters. The order also includes all switch boards and switch gear.

The transformers at each end of the line will be six in number. At the generating end there will be six 3,333 kv.a., 11,000 to 110,000 volt, single phase units and at the distribution end power will be taken care of by six 3,000 kv.a. 100,000 to 12,000 volt units. These latter units will be located at Timmins where a distribution equipment from 12,000 volts down is already in operation.



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St. George Claims Best Street Lighting in New Brunswick

Mayor E. F. McGratton, St. George, N.B., has recently given some interesting information to the Electrical News in regard to the electric lighting system being installed in that town.

The system will be managed by a committee of the town council, which has arranged for the power to be supplied by the St. George Pulp and Paper Company. Enthusiasm runs high over the introduction of electric lighting, and the idea is to be carried out in a thorough manner. The specifications call for one 250 candle power street light for every 12 of population, which it is claimed will give the best street lighting in the Maritime Provinces.

Construction work on the system is rapidly going forward under the supervision of H. M. Faloom of Waweig, N.B. The contract for putting up poles for the transmission line has been awarded to W. J. Snook, of Halifax. All electrical supplies are being furnished by the St. John, N.B., branch of the Canadian General Electric Company.

Several industries in the town will provide a market for power. Mr. W. J. Lynott, town clerk, states that everybody is working and that the electric lighting system will help on the business activity of the town.

Dominion Engineering Working to Capacity

Dominion Engineering Works Limited, Lachine, is working to capacity in its three departments, hydraulic machinery, paper making machinery and miscellaneous. Four 11,300 h.p. turbines are being built for Montreal Light, Heat and Power Company, three 58,000 h.p. I. P. Morris turbines for the Hydro-electric Power Commission of Ontario, one 11,000 h.p. unit for Price Bros., Chicoutimi Mills; one 5,000 h.p. unit for Granby Consolidated Mining, Smelting and Power Company at Anyox, B.C., four 30,000 h.p. units for Shawinigan Engineering Company, Limited, at LaGabelle, Que., four 42 by 30 Larner Johnson valves for Northern Ontario Light and Power Company, two 1,500 h.p. exciter units for Montreal Light, Heat and Power Company, Limited plant at Cedars, Que.; four 3,300 h.p. units for Northern Ontario Light and Power Company; two 7,500 h.p. units for East Kootenay Power Company, Limited at Elko, B.C., and three 192 by 120 Larner Johnson valves for Ontario Hydro-electric Power Commission.

Other items under construction are one 230" newsprint paper making machine for Belgo Paper Co., also 234" newsprint paper machine for Backus Brooks Co., Ontario; also some paper reels for Spanish River, Rubber Masticators for reels for Spanish River and sintering machines for Farrell Foundry and sintering machine for Mond Nickle Co.

A New Electrical Supply House

Wood, Alexander & James, Hamilton, Ontario, announce that they will have a new electrical Catalogue ready for distribution within a few days, which illustrates and lists a complete line of electrical supplies and equipment. In their catalogue they are showing a very complete line of Edwards & Co. Inc., bells, buzzers, annunciators, and signal equipment. They also list Thomas & Betts well known line of conduit fittings and electrical specialties. They are now carrying a large and complete stock of the above lines along with their staple lines, and are in excellent position to render their well established service to all users of electrical goods. They also handle the Canadian drill and electric box line.

C. A. McLean Improving in Health

Mr. C. A. McLean, manager Masco Co. Ltd., has been under the weather for some weeks. Our readers will be glad to know his health is improving and that he is already doing part time at his office.

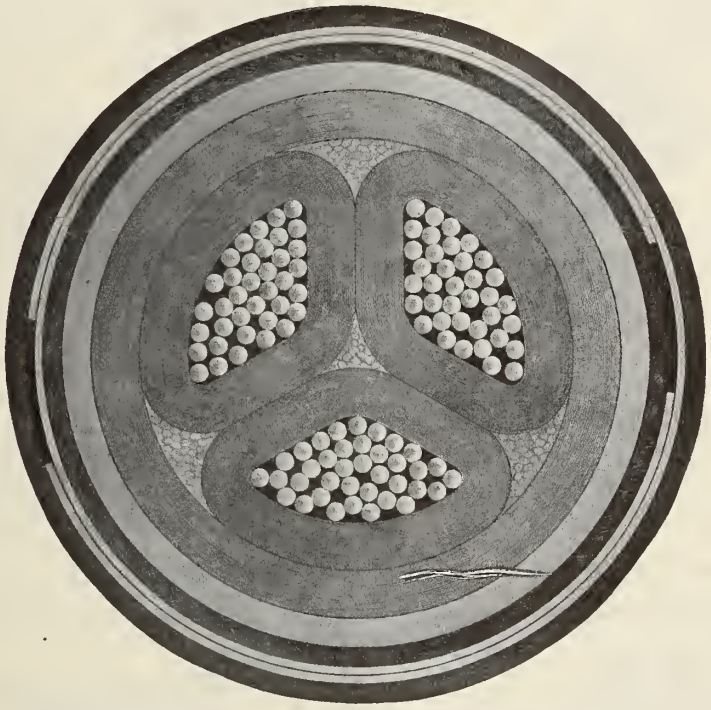
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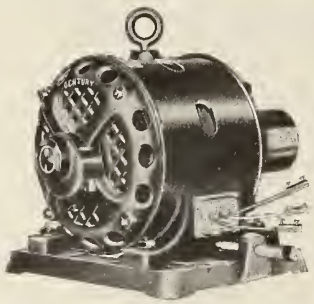
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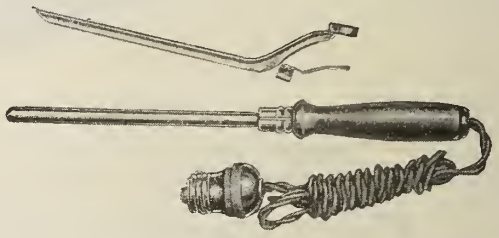
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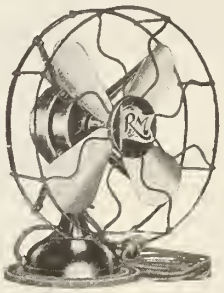
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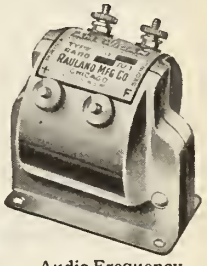
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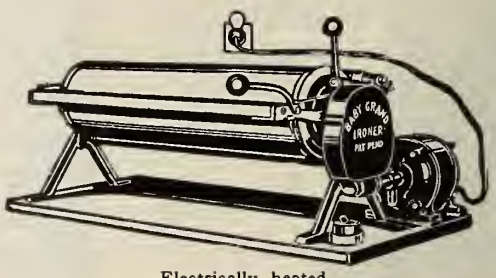
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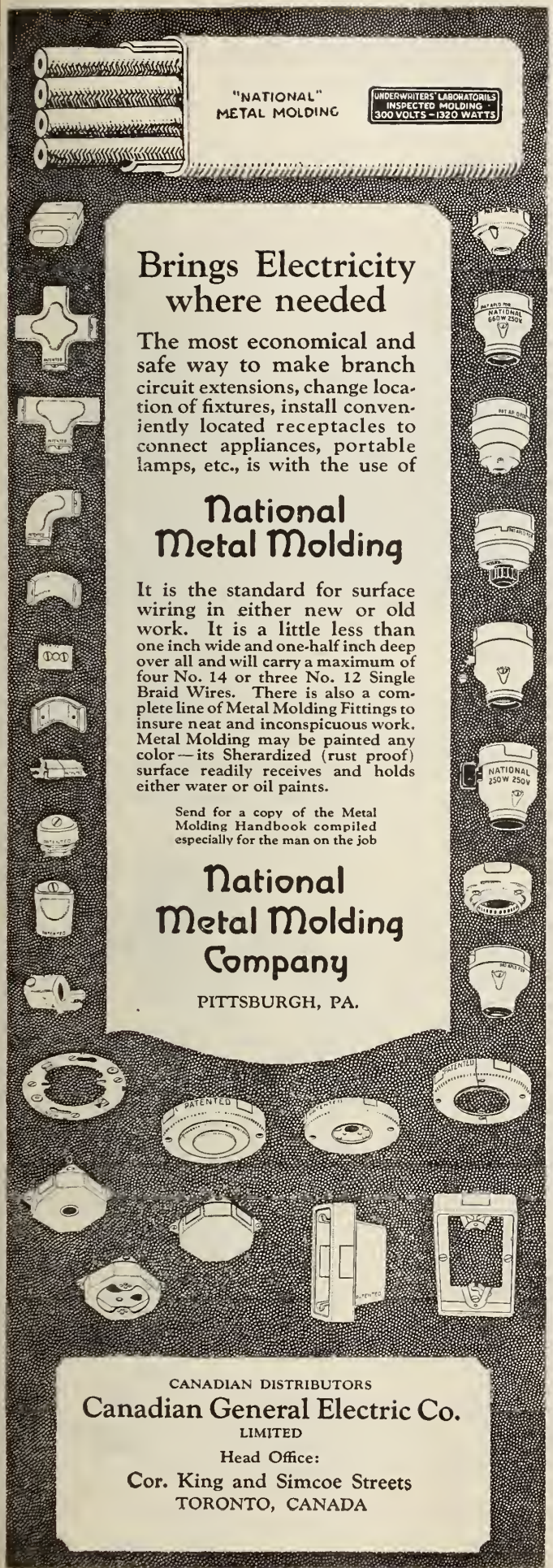
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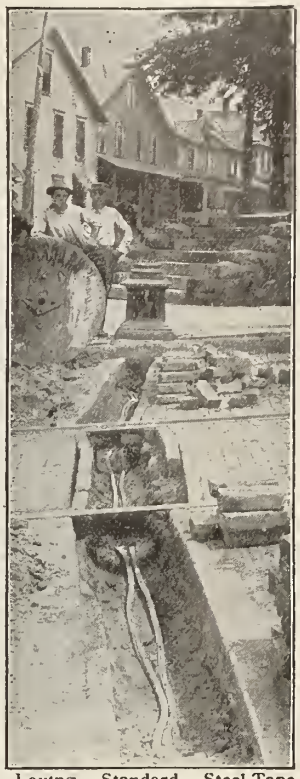
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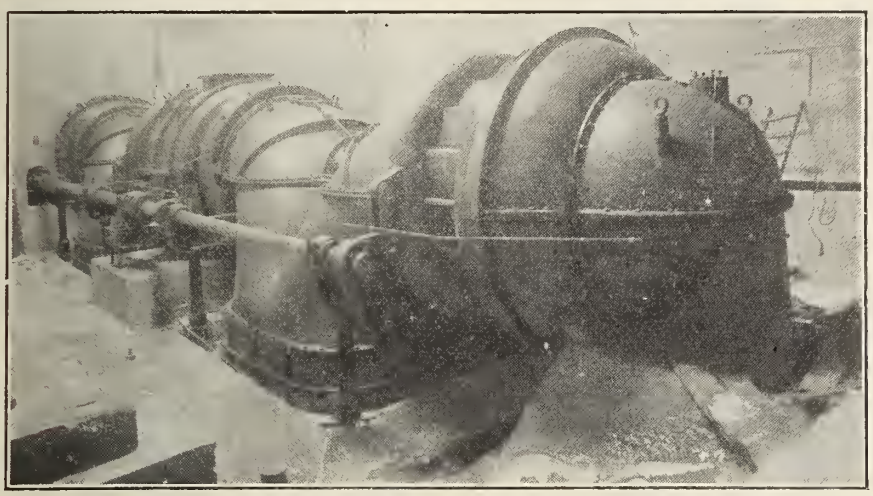
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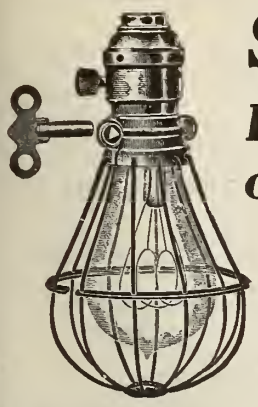
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1—	¼ H.P.	110/220V.	1725 RPM.	Wagner.
1—	¼ H.P.	110V.	1725 RPM.	Aro.
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1—2	H.P.	220V.	1500 RPM.	
1—10	H.P.	220V.	1500 RPM.	T and H.
1—15	H.P.	550V.	1450 RPM.	Westinghouse.
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1—50	H.P.	Crocker Wheeler, 750 rpm. Base, Pulley & Starter.

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1—30	H.P.	Can. Westinghouse 1200 rpm. Base, Pulley & Starter.
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4—½	H.P.	Century, 1500 rpm. Complete.
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3— 2	H.P.	Century 110/220 V. 1460 rpm. Complete.
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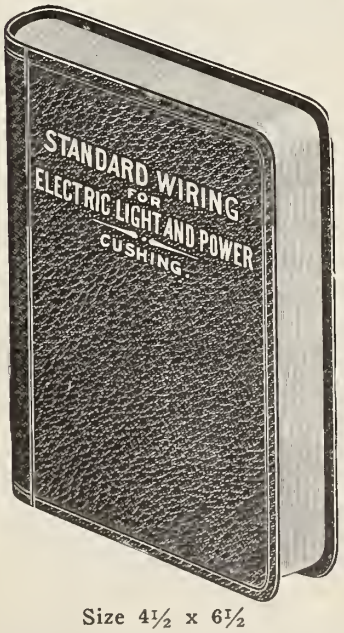
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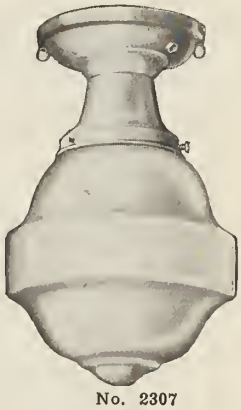
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HERE is a ready-to-use, practical profit plan for Central Stations. Increase the regular watt consumption of your customers. We have for you a proved method whereby your customers replace the old 40-watt lamp with a 150-watt type C. It means a profitable increase in your load.

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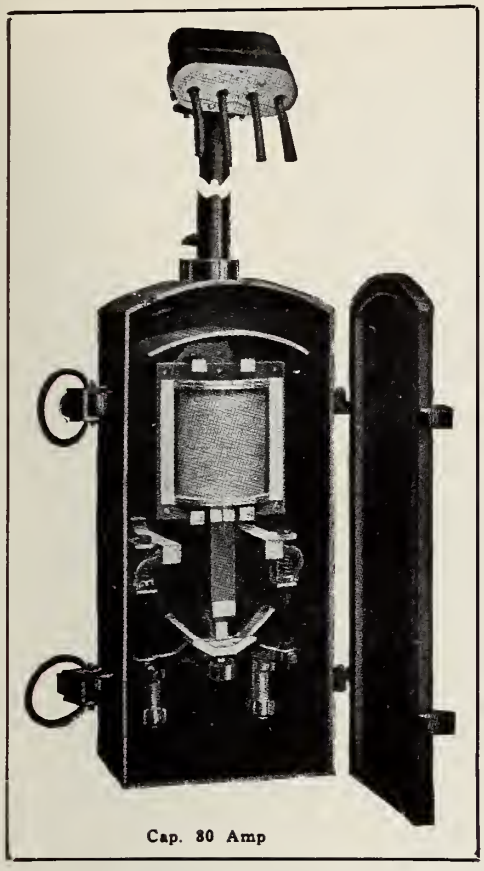


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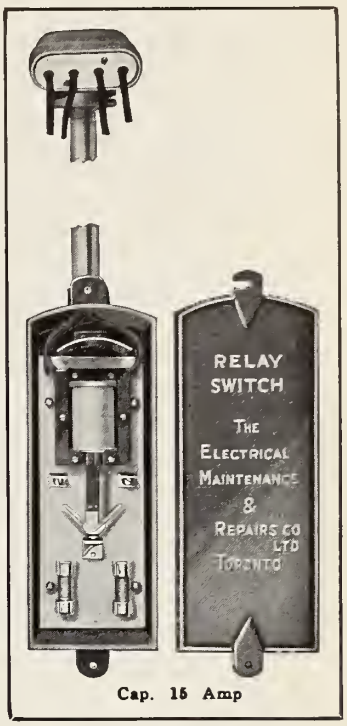
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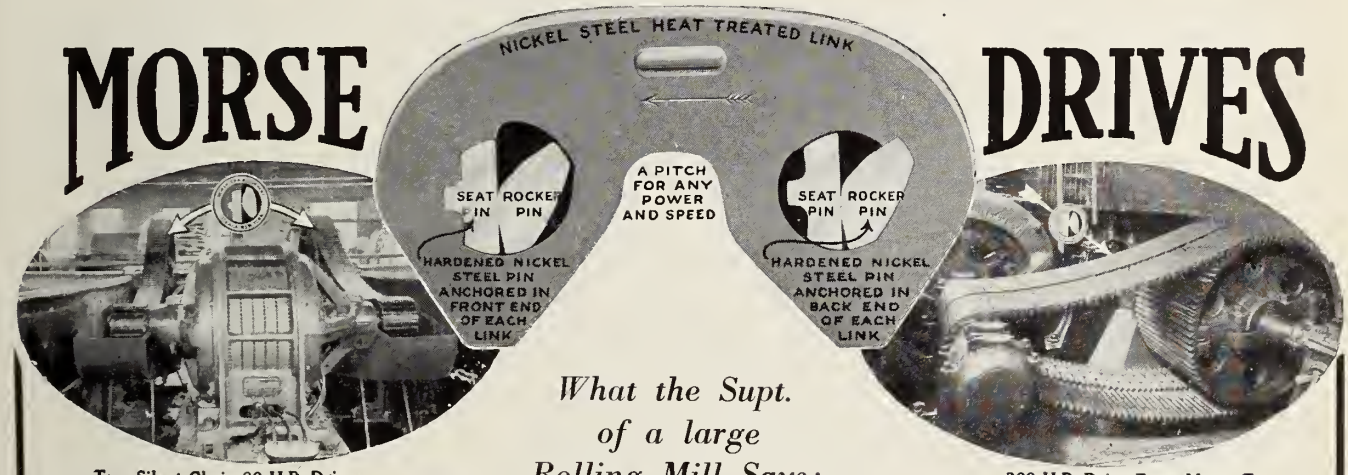


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Two Silent Chain 80 H.P. Drives

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What the Supt. of a large Rolling Mill Says:-

"When we erected our rolling mill in 1914 the question of what we should use for driving the mills came up and it was either chain drives or gears. Our decision rested with Morse Silent Chain Drives because first, of their reputation, second, because they were more economical than gears, third, because there was less chance of breakage with Morse Chains. Two 600 H.P. Morse Chain Drives are driving our rolling mills and practically all our motors about the Plant are also now equipped with Morse Chains.

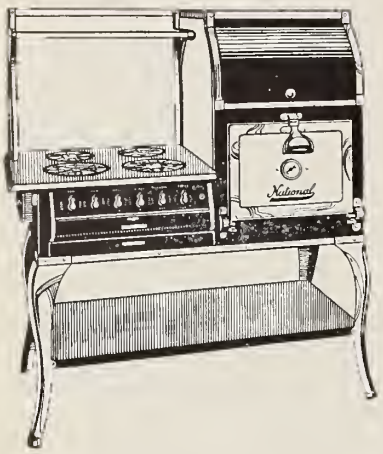
"Our first which was one of the 600 H.P. was purchased eight years ago and today it hasn't cost us anything for repairs—and has given us absolutely no trouble. This is merely typical of our experience with this equipment. Our Morse Drives have had unusually hard usage for easily 50 per cent of the time they have been in operation practically 24 hours out of each day on work that is a severe test because the load is not constant."

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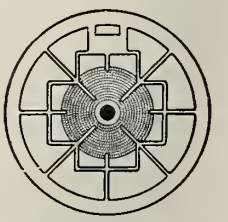
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The new burner is so decided an improvement that its tremendous superiority is recognized on sight.

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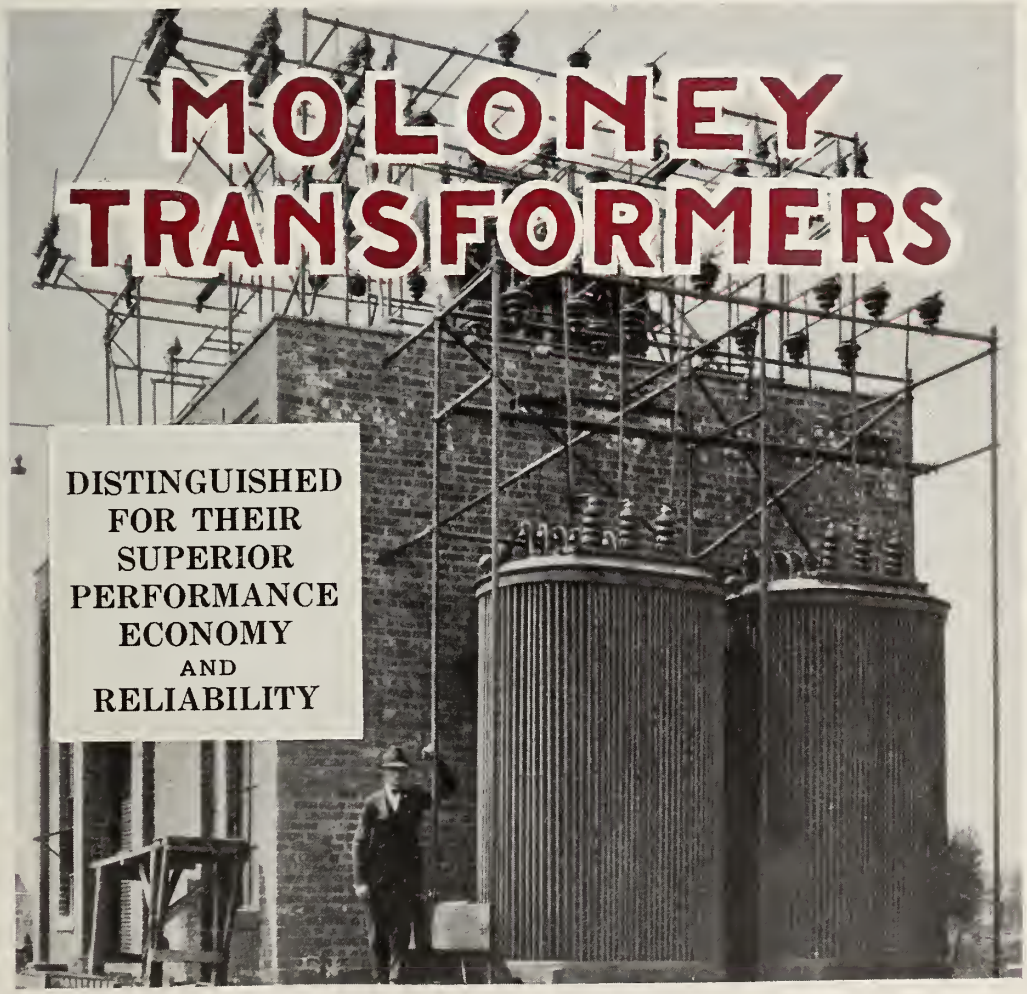
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AERIAL VIEW OF VANCOUVER, B. C.



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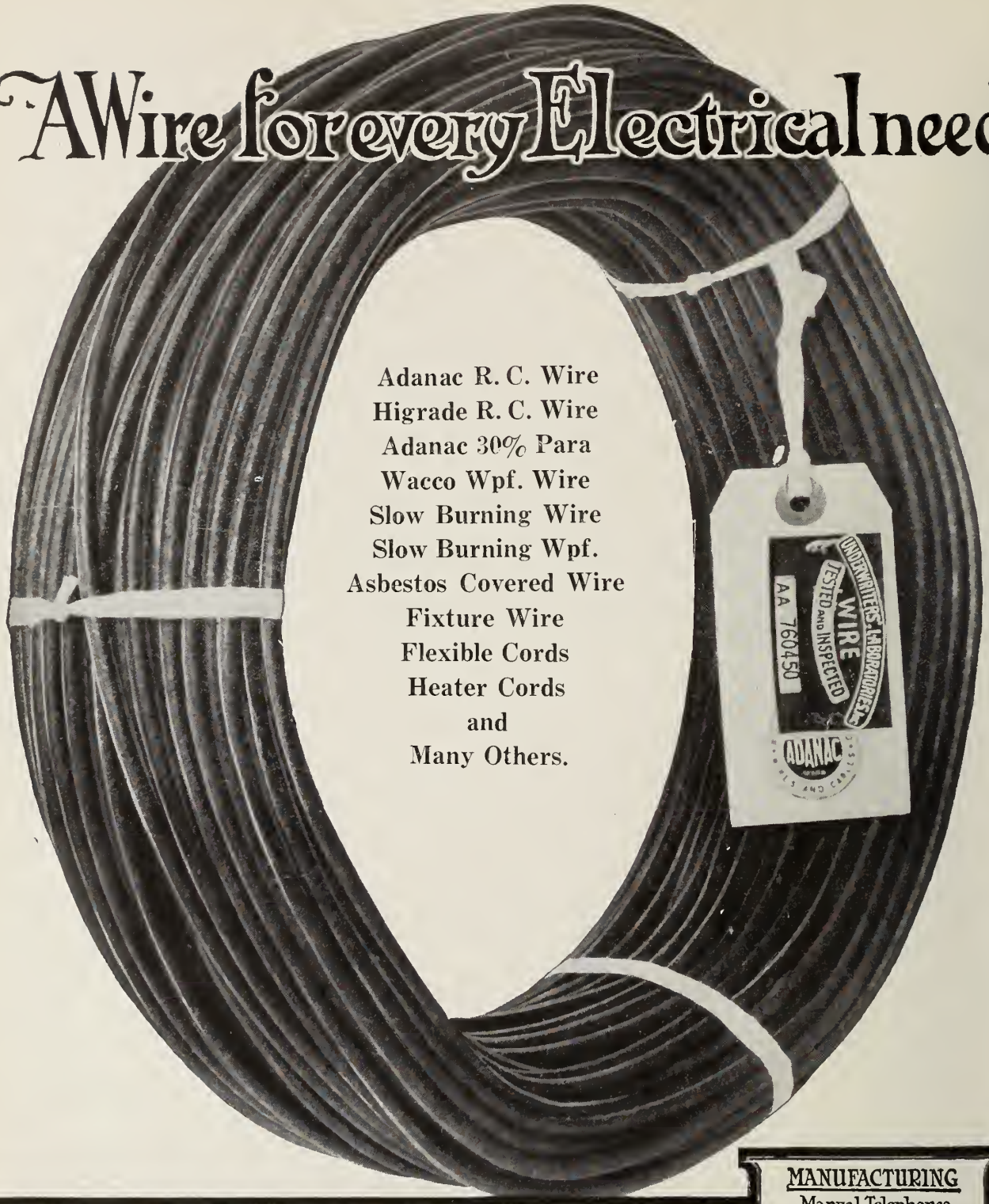
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You Can't Travel on Your Calling Card These Days—You Have to Deliver the Goods

The man who permits the times to get ahead of him instead of keeping abreast of the times will find himself left far behind in the race for busines in the face of modern high-pressure competition.

The man who not alone keeps abreast of the times but is even a little ahead of them is the man who stands out from the multitude and is instantly in the mind of prospective buyers when they are in the market for the product he has to sell.

If you are such a man as the last described, you will instantly see the money-making possibilities of the Franchise Plan of merchandising electric lighting fixtures.

It is years ahead of the times in its revolutionary changes from the present dried and cut methods of selling.

It is years ahead of the times in the fixture designs that emanate from it.

The man who becomes a Franchise Holder in his particular territory becomes so far ahead of all competition that he is instantly recognized as the "Fixture Man" of his particular town or city.

The man who is a Franchise Holder buys one fixture at the same price as though he were buying hundreds.

Summarily, no dealer can afford to let his competitor be a Franchise Holder.

If you have not the full particulars about this modern plan of merchandising electric fixtures, get them right away before your competitor beats you to it; and become a Franchise Holder before he does.

There is a tide in the affairs of men which taken at the flood leads on to success.

This is your opportunity. Take immediate advantage of it. It means to you, exclusiveness, reputation and advantageous buying, a combination which spells PROFITS in capital letters.

THERE'LL BE A FRANCHISE EVERYWHERE

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TORONTO - - ONTARIO

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We have recently perfected a new cased-glass for Commercial Lighting Units.

The experiments have been made to produce a glass which would give the highest efficiency and pure white rays, which is the new demand for Commercial Lighting.

We have succeeded in combining these two features in our new cased-glass.



Where the highest efficiency and color of light are required, this cased-glass will meet all requirements.

The following units are now made in cased-glass. No's. 396, 397, 398, 399, 515, 516, 517 and 555, 556, 557, 1060, 1061, 1062 and 1063.

Prices and full particulars will be forwarded on application.

Tested and Approved for Use with Nitrogen Lamps.

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WATERPROOF
NOISELESS GEARS

Condensite Celoron gears and pinions eliminate the distracting clash of metal on metal, reduce the mechanical wear and tear, besides making for economy and efficiency in production.

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Diamond-F

Radio Panels made of Condensite Celoron bear the approval of the leading experts in the field. Send for our booklet.

DIAMOND FIBRE PULLEYS

Wood pulleys split; metal pulleys crack; paper pulleys absorb oil. Diamond Fibre pulleys do none of these things and in addition give greater traction, more power, less slipping—hence their growing popularity in the electrical and mechanical fields.

We make them—to your own specifications if desired.



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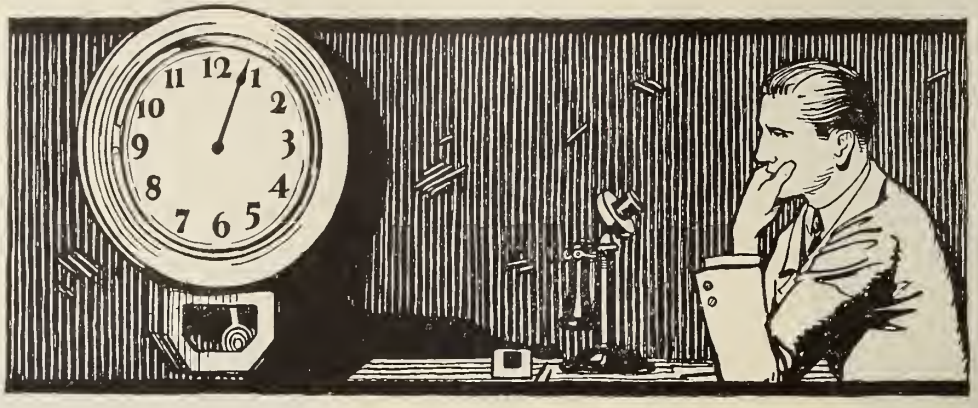
Thomson Electric Motors

in use in many of the largest manufacturing plants in Canada

are built by

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7-13 ST. GENEVIEVE STREET MONTREAL



How Could You Tell Time by THIS Clock?

THE minute hand on a clock may be compared to a watt hour meter—the hour hand to a demand meter.

Without an hour hand, you must guess at the hour just as you must guess at the demand of a customer who has no demand meter.

But by means of a minute hand **and** an hour hand, you **know** the **exact** time of day just as you know **exactly** how much to charge a customer when you know his watt hour and demand readings. Your charges are based upon the way in which each customer takes his current as well as how much he takes.

Lincoln Maximum Demand Meters measure demand either to a Watt or to a Volt Ampere basis, considering power factor. They are accurate and reliable. They have been adopted as standard throughout the Dominion.

Write for the section or (sections) of the Lincoln Meter catalog which interests you. SECTION I is a non-technical treatise on why demand should be measured; SECTION II the technical treatise on demand measurement; SECTION III, Installation; SECTION IV, the Lincoln Graphic Demand Meter, SECTION V, the Lincoln method of Volt-Ampere Demand Measurement (Power Factor recognition); and SECTION VI, the Lincoln Split Core Transformer and Demand Ammeter.

The Lincoln Meter Co., Limited
72-74 Stafford Street, Toronto, Canada
Cable "Meters" Toronto. Phone Trinity 1374

Hand now on left varies with load and shows this load at any time of day.

Hand now on right moves only to right and indicates maximum load since last resetting.



The Lincoln Demand Meter is available with the Sangamo energy Meter—sold as the **Lincoln-Sangamo** DEMAND ENERGY **meter**

Lincoln MAXIMUM DEMAND meter



Sangamo Polyphase

Adjustment with Ease and Accuracy



Light Load Adjustments

Torque Balancing Adjustment

Full Load Adjustment

The Sangamo Energy Meter is available with the Lincoln Demand Meter sold as the

Lincoln-Sangamo DEMAND INDICATING **meter**

THE Sangamo Way of meter adjustment on the Type "H" Watthour meter eliminates all guesswork. It provides a positive, easy and simple way of adjustment which saves time and trouble.

Light Load Adjustment—As shown in the above illustration, Light Load Adjustment is accomplished by turning the micrometer adjustment screws a fixed amount for each per cent of desired correction. One complete revolution of the micrometer screw produces an approximate change of 2½ per cent. Consequently each division represents ¼ of 1 per cent.

Torque Balancing Adjustment. There is no guesswork in balancing Sangamo meters for torque: simply buck the elements and turn the torque balancing screw until disc movement ceases.

Full Load Adjustment is accomplished by loosening the clamp screw and turning the iron disc indicated above. Turning the iron disc one way brings it closer to the magnets thereby speeding up the meter. Turning it the other way removes the iron disc a greater distance from the magnets and slows up the meter. When adjustment is made the clamp screw locks it in position. **All accomplished without moving the magnets.**

After the meter is once adjusted the entire moving element may be removed without seriously affecting the accuracy of adjustment.

Simplified adjustment is only one of Sangamo features which you will appreciate. Let our nearest agent send full information. Ask for Bulletin 5518 fully describing type H alternating current Watthour meters.

SANGAMO

Sangamo Electric Company of Canada, Limited

Factory: TORONTO **Head Sales Office: MONTREAL**

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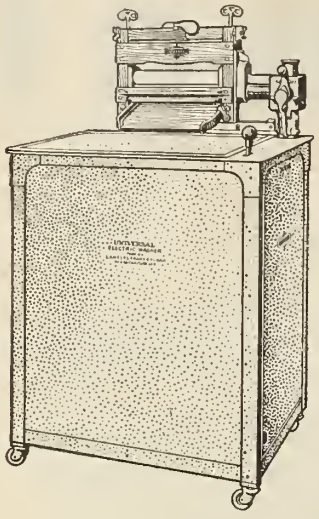
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Toronto



Our Vancouver District Office

AS this issue of Electrical News is devoted to British Columbia we feel it is only fitting that a word should be said regarding our Vancouver District Office.

C. G. E. Sales Branches are spread across the Dominion from the Atlantic to the Pacific. Our Branch Managers, and their respective staffs at all times, are willing and anxious to render every assistance possible to the Electrical Industry.

The Vancouver District Office, in charge of Mr. H. Pim, District Manager, is one of the oldest Branch Offices of the Organization. Mr. Pim and his Staff are saturated with the spirit of the West. Their one aim in life is to serve our customers on the Pacific Coast.

On behalf of our Western Branch Managers we extend a cordial invitation, to the Electrical Industry, to visit them, and make every use of the facilities they have at their disposal to render you Service.

Canadian General Electric Co., Limited

HEAD OFFICE TORONTO

Branch Offices: Halifax, Sydney, St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

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For Small Houses







For Summer Homes



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THERE is a market for Hotplates worth cultivating. Electrical convenience is the topic of conversation in thousands of homes to-day. There are many people who cannot afford, or do not require a complete electrical range, but these people are still entitled to the comfort and convenience of electric cooking.

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of

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HOTPOINT DIVISION

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The Standard of Quality



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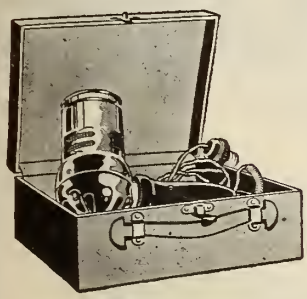
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STAR-Rite

ELECTRICAL NECESSITIES



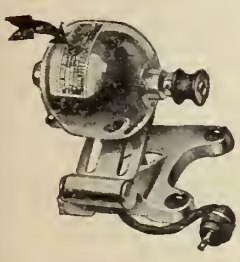
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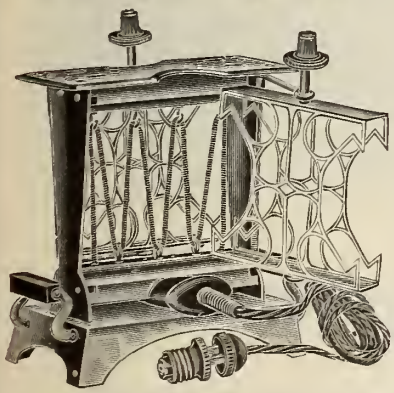
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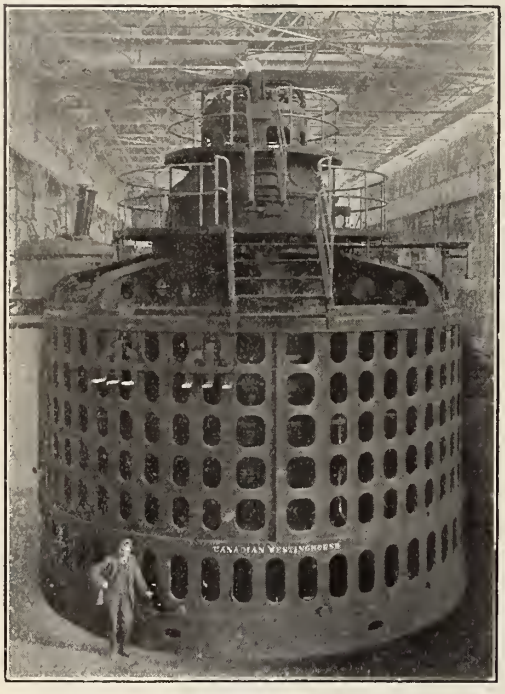
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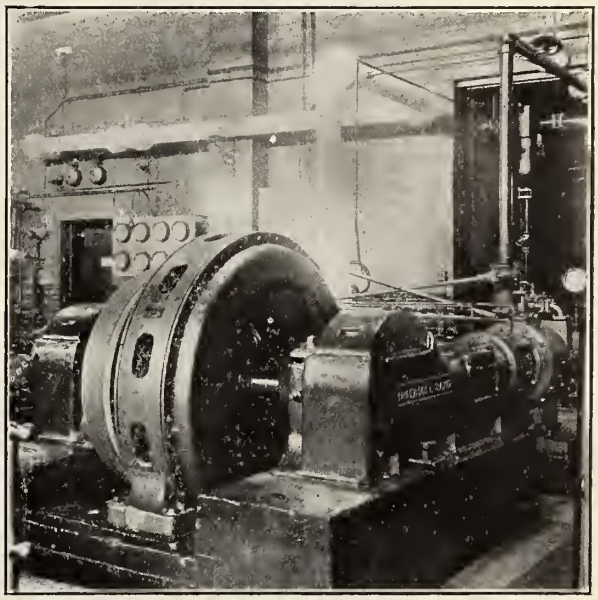
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Hamilton - Ontario

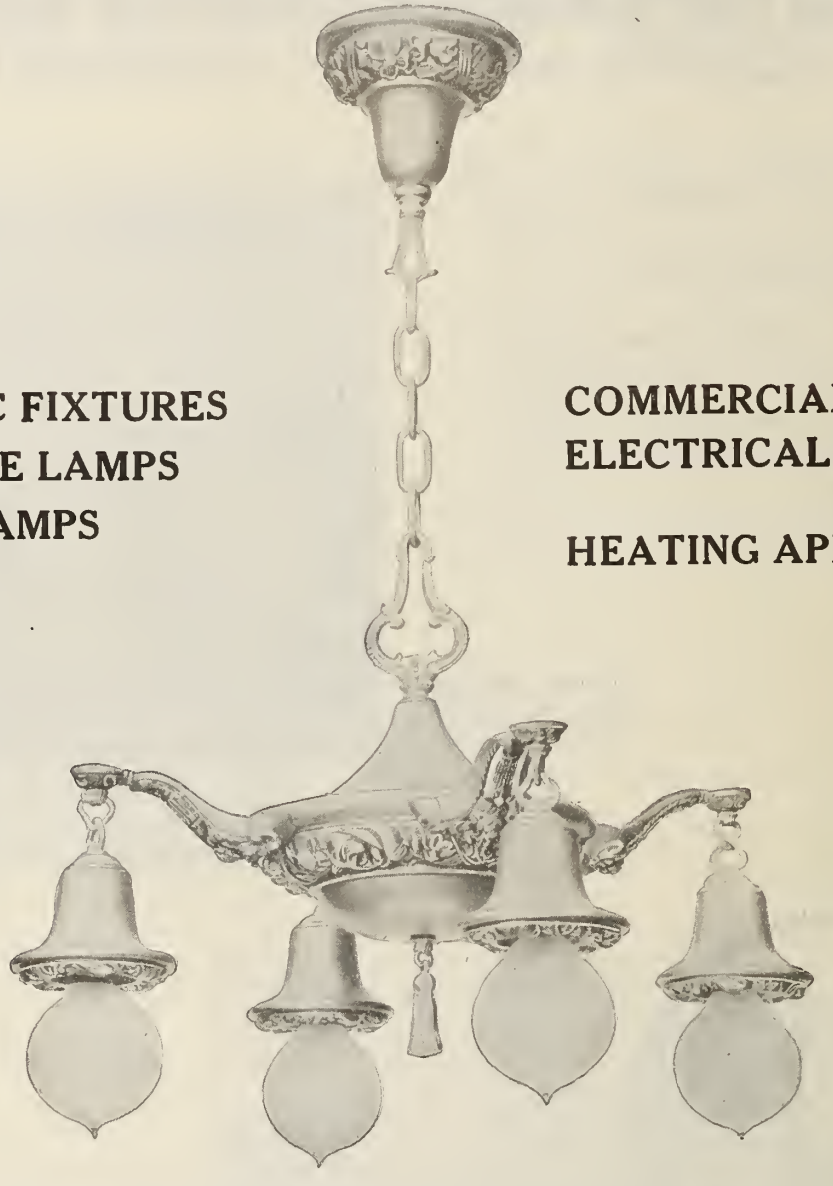
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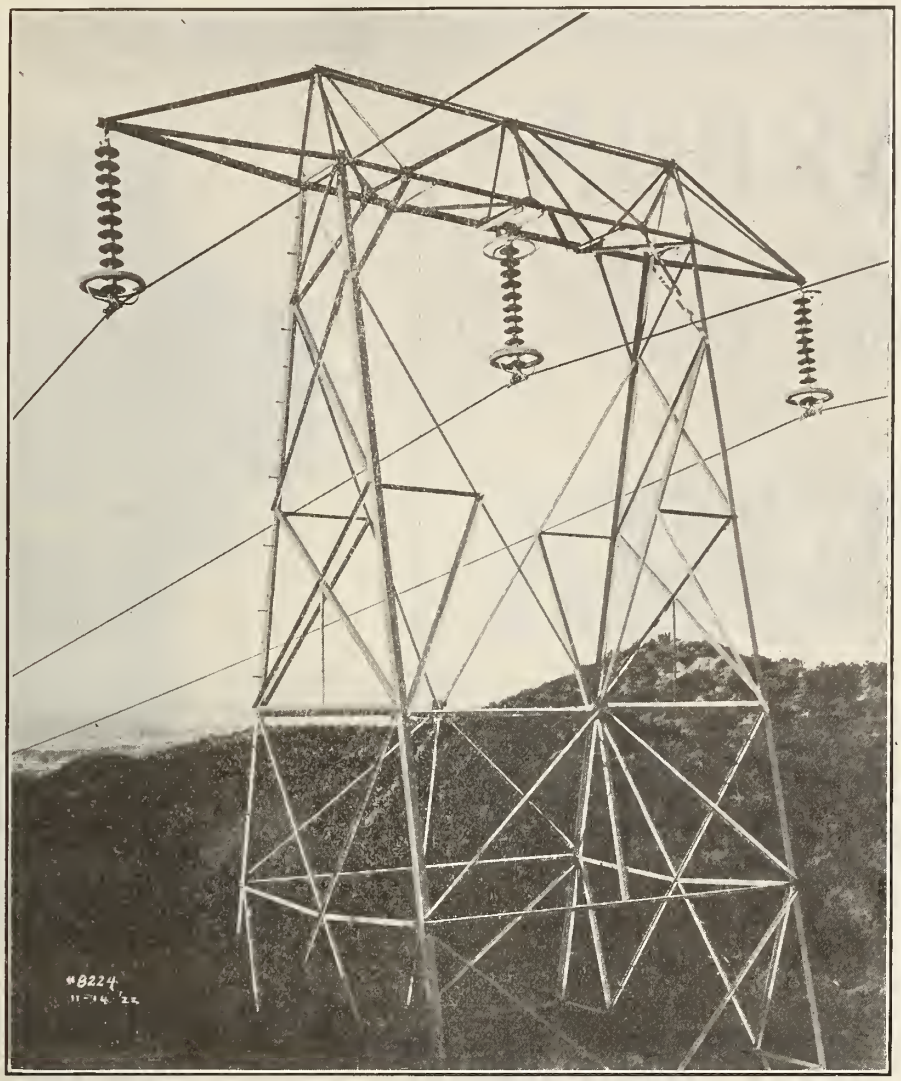
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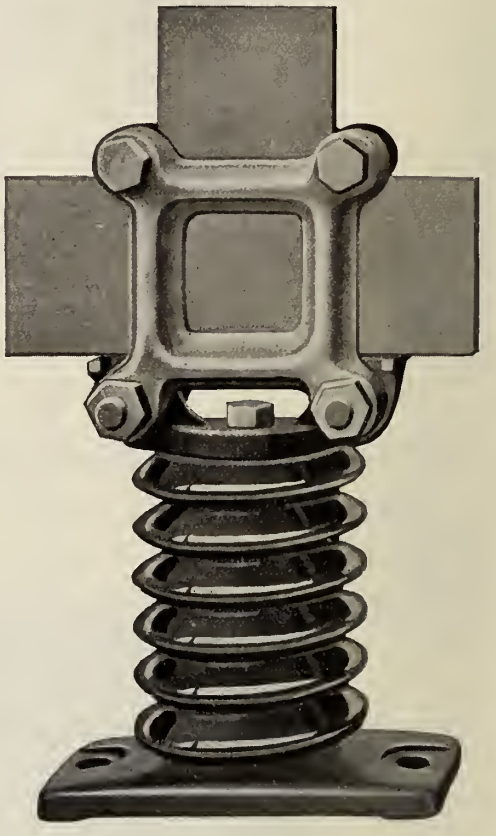
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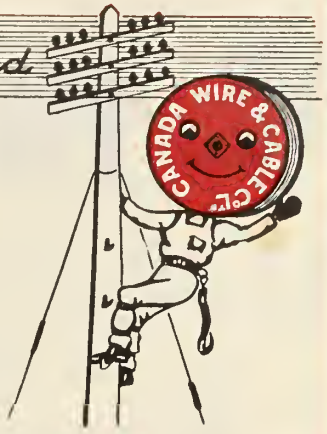
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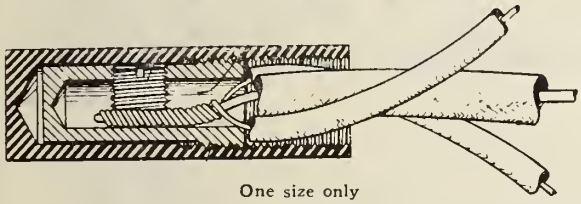
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Takes Two to Eight No. 18 Stranded Wires

Make joint in regular manner, leaving just enough wire to enter Connector, after twisting wires together leave only half-inch bare wire to enter brass tube, tighten set screw, then screw on insulation cap and

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Scrape off outlet wire insulation half-inch, scrape off fixture insulation wire one inch, twist fixture wire around outlet wire, insert in brass tube, tighten set screw, then screw on insulation cap, and

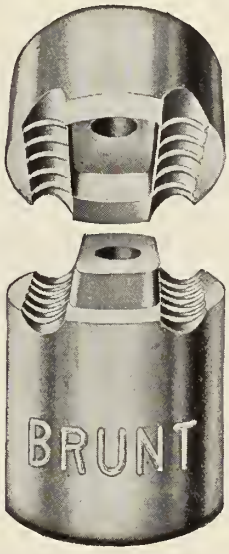
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TRENTON, N. J.

Manufacturers of Electrical Porcelain Specialties. Also specialize in the manufacture of heater bricks for electric ranges.

—To The Jobbers—

■

The following SLOGAN has been adopted as one of the objectives of this year's work:

"Adequate Protection for the Electrical Trade"

Electragists should be better recognized as the proper and legitimate outlet for Manufacturers and Jobbers. Railroads and such very large Industrial concerns as regularly maintain a permanent staff of more than one electrician excepted.

The evident tendency of the Jobbers towards direct dealing with the Consumer is deplorable. It is the intention of this association to support those Jobbers who will express their policy in affording adequate protection to the Electrical Trade.

■

VANCOUVER ASSOCIATION OF ELECTRAGISTS

(International)


No. 1


No. 2


No. 11

MAGNUS


No. 22

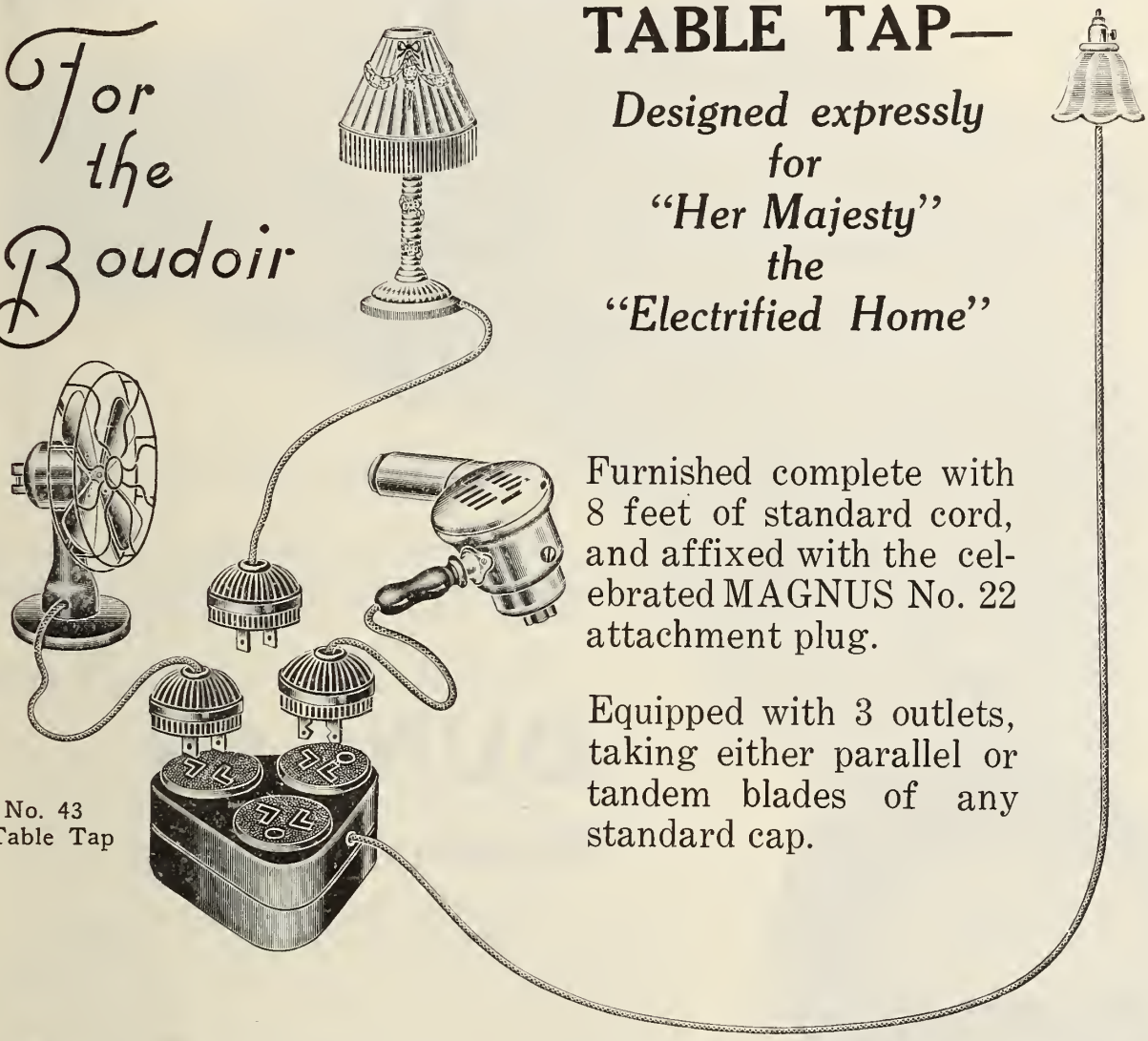

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MADE IN CANADA

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The battery that lasts and *lasts* and *lasts*

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I am offering for sale the Canadian sales and manufacturing rights for the ironing machine manufactured and sold in the United States under the name "Deming". These rights include blueprints, patterns, jigs, dies, templates—everything with which to go into immediate production.

The Deming Ironer is being manufactured in the United States by The Deming Manufacturing Company, main office in Cleveland, with well-equipped factory at Medina, Ohio, a short distance away. The company is soundly established and business is increasing rapidly.

The Deming presents most unusual features in an ironing machine. A detachable U-arm presents a full open end that allows the operator to slip a skirt or dress entirely over the end to be ironed single, just as over an old-fashioned ironing board. This full open end is unique in that it affords the wide range of operation afforded only by true open-end ironers, and the rigidity and durability of closed-end machines.

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The Deming Ironer is the result of several years' earnest and costly experimentation and is now a fully developed, tested and proved appliance, with all the imperfections that beset a new product entirely eliminated.

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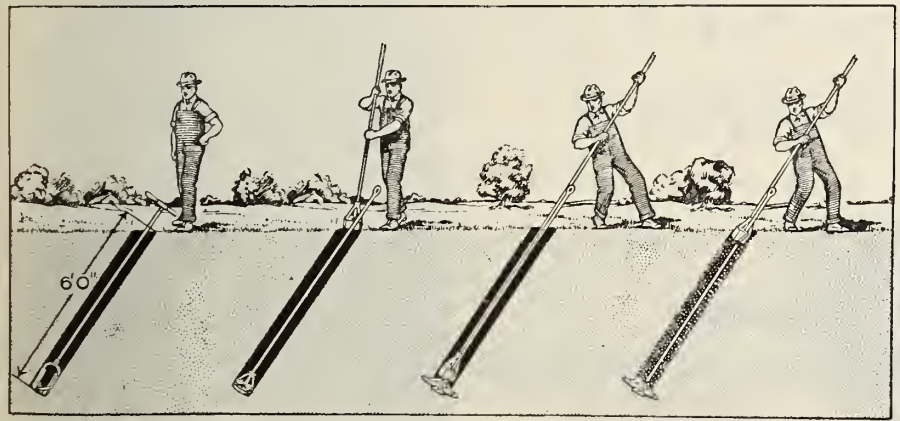
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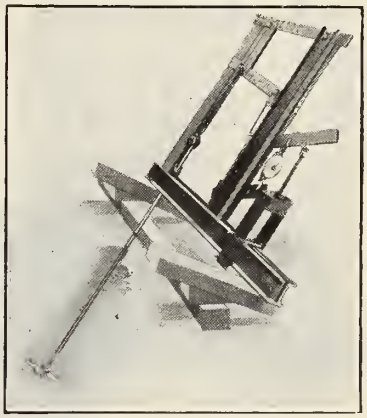
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CROWN LINE



For thirteen years CROWN designing and manufacturing have served but one ideal—to conform faithfully to the most rigid requirements of the discriminating Lighting Fixture buyer. Thus, the name CROWN is today synonymous with highest quality, with supreme good taste, with extraordinarily fine appearance, with thoughtful refinement, that emphasize the skill and care in contruction. The CROWN line of today has attained new and unprecedented heights. The wide spread recognition has forced CROWN production to the highest point in its history.

Have you secured your copy of our new No. 16 catalogue? It contains a special Twenty-four Hour Shipment feature.

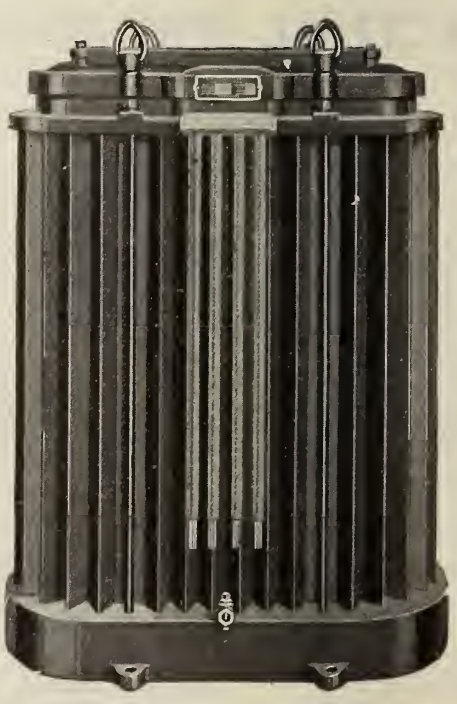
"Notice the Lighting Equipment"
"Everywhere you go"

Crown Electrical Mfg. Co. Ltd.
Brantford, Ontario

FERRANTI Transformers



Series street lighting Transformer adapted for laying in the ground at foot of Lighting Standard. Primary circuit is taken in one end and out the other end with the two secondary leads together at one end through wiping sleeves of tinned brass tube.



FERRANTI - 100 K.V.A. Outdoor Type Transformer in Corrugated Sheet Steel Case

Ferranti Meter and Transformer Mfg. Co., Limited
Toronto Montreal Winnipeg Halifax Timmins Calgary
Write to Our Nearest Office. Bulletins, Prices and Information on request

Pow-R-full
a new standard in motor investment

IT is a difficult matter to do justice to the new Wagner Pow-R-full Motor in advertising.

So many superlative adjectives are encountered in reading current advertising of the regular run of standard equipment, that when something that constitutes a really important advance in the motor field is produced it is difficult to advertise it with proper emphasis.

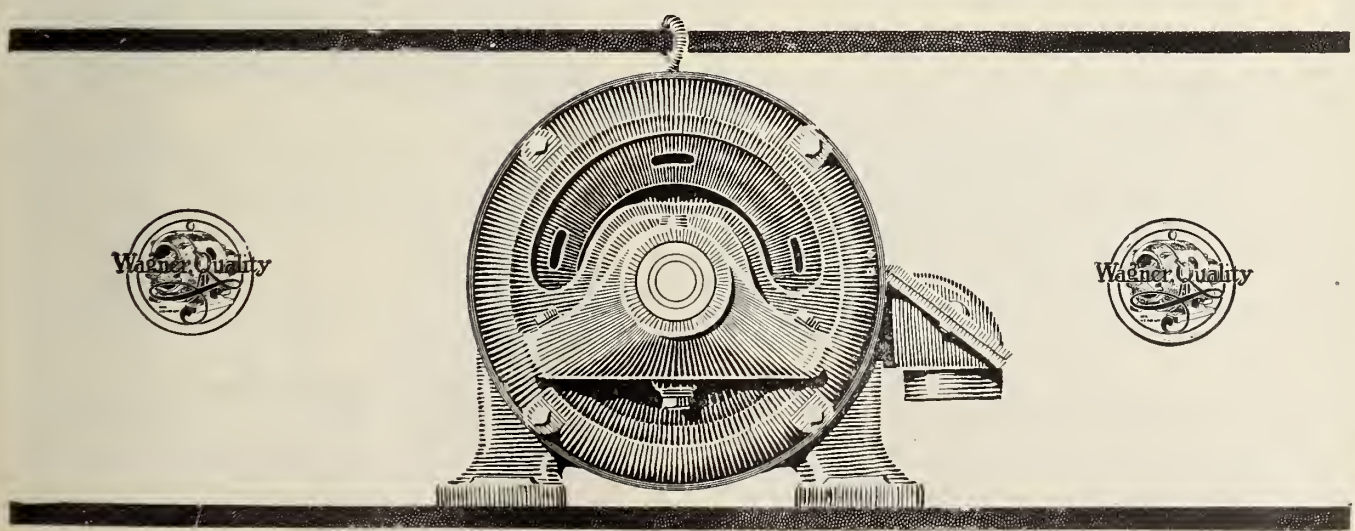
The simple fact is that the Wagner Pow-R-full Motor sets a new standard in service return from motor investment.

The Wagner Pow-R-full Motor will safely carry more overload for a longer period than any other motor of the same rating.

Dollar for dollar the new Wagner Pow-R-full Motor gives better value, more service return, on motor investment.

Write for bulletin 13213.

WAGNER ELECTRIC COMPANY OF CANADA, LIMITED
Power Building, Montreal 217 Dundas St., Toronto



61-5520-9

"Notice the Lighting Equipment"
"Everywhere you go"

He's enthusiastic about the new "3000" & "4000" Line

RECENTLY an electrical contractor-dealer in Quebec wrote to let us know how well satisfied he was with the "3000" and "4000" Line Lighting fixtures, and how well these fixtures were selling.

When a busy electrical contractor, without being asked, takes the trouble of writing the manufacturer you'll agree that he's enthusiastic.

There is good reason, however, for this enthusiasm. The "3000" and "4000" Line, Imperial Design, lighting fixtures is without doubt one of the most popular and best selling lines in recent years. Fixtures that enable you to offer your customers something new, different and practical at a moderate price.

Ask your jobber about the Line that Sells and Satisfies. In the meantime may we send your copy of the handy pocket-size catalogue?

W. H. BANFIELD & SONS Limited

370-386 Pape Ave., TORONTO

MONTREAL
A. B. Cornwell,
51A Sussex Ave.

WINNIPEG
Cochrane, Stephenson & Co. Ltd.,
602 Avenue Block

VANCOUVER
Cochrane Stephenson & Co. Ltd.,
901 Credit Foncier Bldg.

NUMBER 4

This is the fourth of a series of ten advertisments

The Line that R. and I. E. Co. Builds!

This is the



Steel Channel Base, Forged Steel Rotor Shaft. Babbitted Bearing. No corrosive parts. Bearing protected from rain and sleet

That holds the



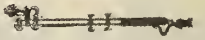
R. & I. E. Interchangeable Insulator Units with Forged Steel Pins and Pressed Steel Caps. No clamps, no screws

That carries the



Laminated Copper Brush Contact, completely covered with a Sleet Hood and protected from all burning by Bronze Arcing Horns

That receives the



Truss Blade with adjustable toggle contact block. Simple clamp terminals

That makes up the



R. & I. E. Horn Gap Switch. It is dependable and is being successfully operated under all climatic and service conditions in all parts of the world. No Torsion or other undue strains on the Insulator Units. A minimum number of moving parts. A ⅜" bolt is the smallest bolt employed in construction.

Interchangeable Unit Air Break Horn Gap Switch that R. and I. E. Co. Builds

R. & I. E. Interchangeable Insulator Unit Equipment for outdoor service includes Bus Supports, Disconnecting Switches Air Break Horn Gap Switches, Choke Coils, Fuse Holders, Lightning Arresters, Substation Combinations and Outdoor Steel Substations.

Manufactured by

Railway and Industrial Engineering Co.
Greensburg, Penna.

4



Patented

Street Lighting Equipment

Up-to-Day Units

Canadian Made

To meet every requirement of modern street lighting.

We also solicit your enquiries for the products of

Weston Electrical Instrument Co.
The Bristol Co.
Albert and J. M. Anderson Mfg. Co.
Philadelphia Electrical & Mfg. Co.
Railway & Industrial Engineering Co.
General Devices & Fittings Co.
G & W Electric Specialty Co.
Weinhagen & Hespe.

Powerlite Devices

Limited

Successors to

A. H. Winter Joyner, Limited

62 Front St. W. TORONTO
New Birks Bldg. MONTREAL

British Columbia Electric Railway Co. Ltd.



Subsidiaries:

Vancouver Power Co. *Vancouver Island Power Co.*
Western Power Co. of Canada *Burrard Power Co.*
Vancouver Gas Company *Victoria Gas Company*
British Columbia Gas Company

ELECTRIC RAILWAY, LIGHT and POWER SERVICE

in

Vancouver, Victoria, New Westminster, North Vancouver, Abbotsford, Chilliwack, White Rock, Ladner, Port Moody.

GAS SERVICE

in

Vancouver, Victoria and suburbs

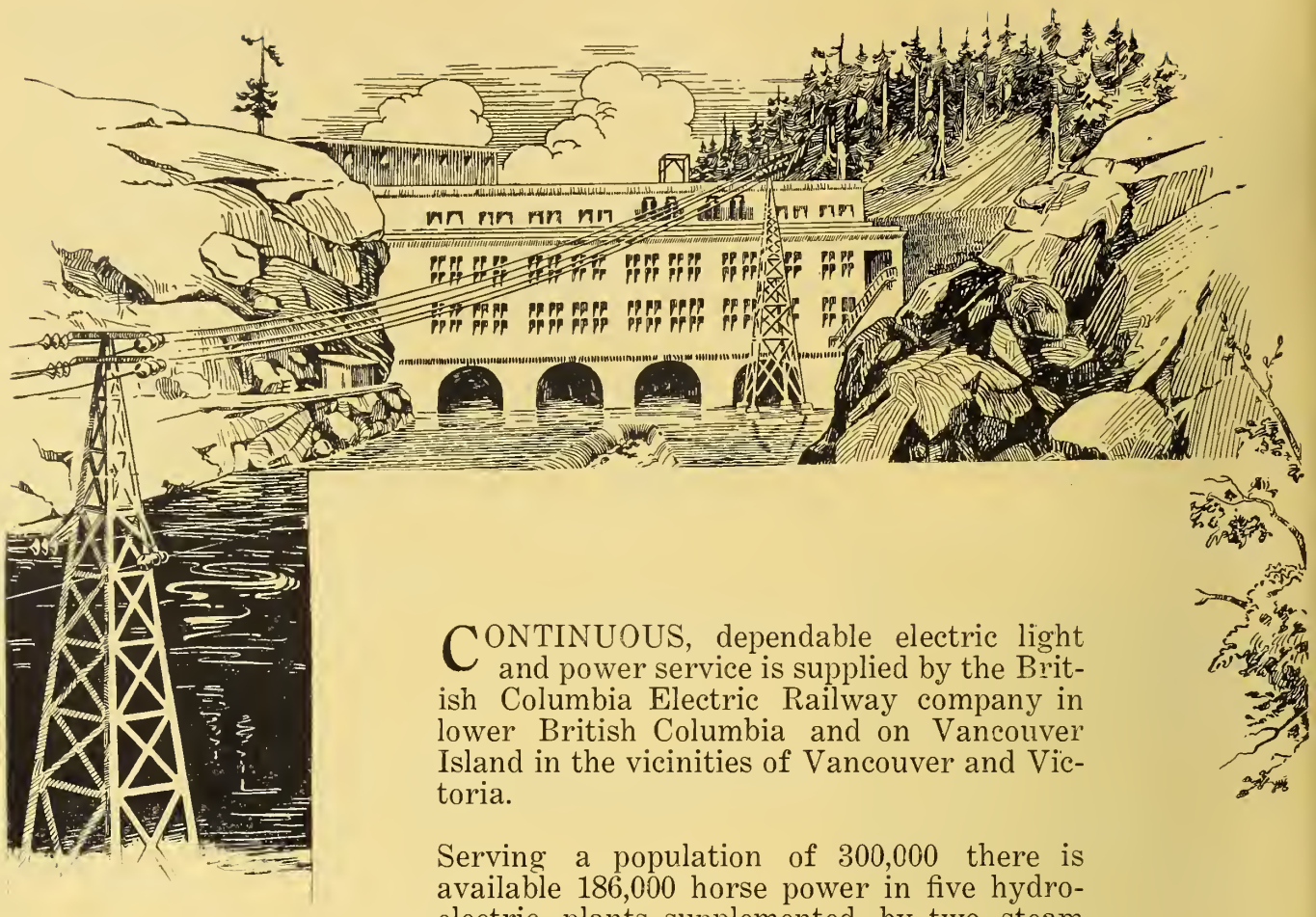
Capital Investment—$60,000,000

GEORGE KIDD
President, Vancouver

W. G. MURRIN
Vice-President, Vancouver

A. T. GOWARD
Vice-President, Victoria





CONTINUOUS, dependable electric light and power service is supplied by the British Columbia Electric Railway company in lower British Columbia and on Vancouver Island in the vicinities of Vancouver and Victoria.

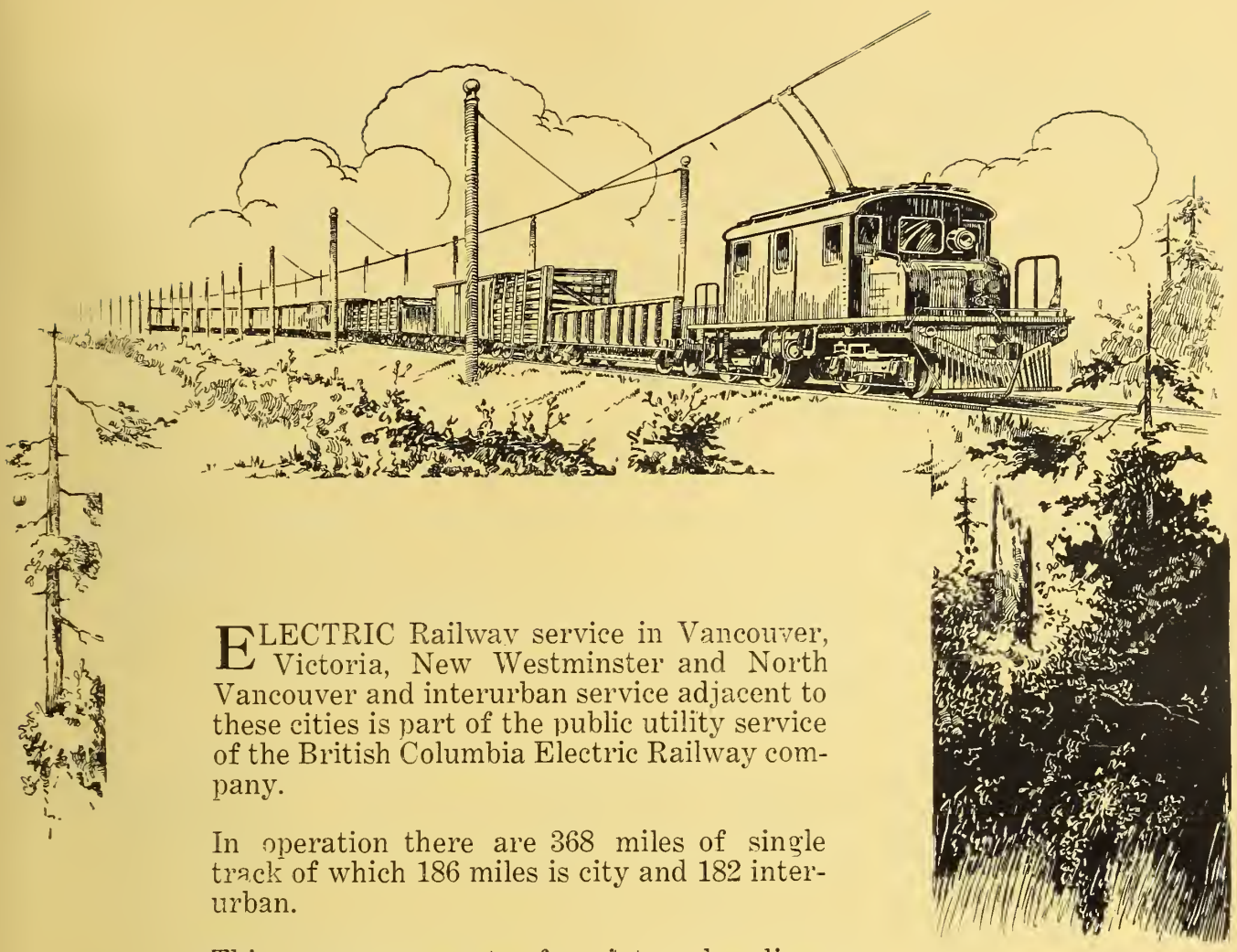
Serving a population of 300,000 there is available 186,000 horse power in five hydro-electric plants supplemented by two steam stand-by plants.

On the mainland, three hydro-electric plants serve a territory 80 miles long and 40 miles wide, covered by a network of transmission and distribution lines, bringing thousands of industrial sites within reach.

Work is now under way to increase the kilowatt hour output of the Stave Falls plant 50 per cent and plans are prepared for developing 115,000 horse power additional in three new plants.

Low rates for power are quoted industries. Write Sales Engineer, Vancouver or Light and Power Manager, Victoria, for schedules.

BRITISH COLUMBIA



ELECTRIC Railway service in Vancouver, Victoria, New Westminster and North Vancouver and interurban service adjacent to these cities is part of the public utility service of the British Columbia Electric Railway company.

In operation there are 368 miles of single track of which 186 miles is city and 182 interurban.

This company operates four interurban lines on the mainland and one on Vancouver Island, including the longest interurban line in Canada, Vancouver to Chilliwack, 76 miles.

Freight service is given on interurban lines, factories on our lines enjoying interchange with all steam roads, including C. P. R., C. N. R., G. N. R. and C.M. & St.. P.

Factories considering locating on our territory will gladly be furnished with all information to enable them to form definite plans.

George Kidd, President
W. G. Murrin, Vice-President, Vancouver
A. T. Goward, Vice-President, Victoria

ELECTRIC RAILWAY CO. LTD

Earning Power is the Controlling Argument

The gross earnings of a pipe line are the same whatever the material used in its construction.

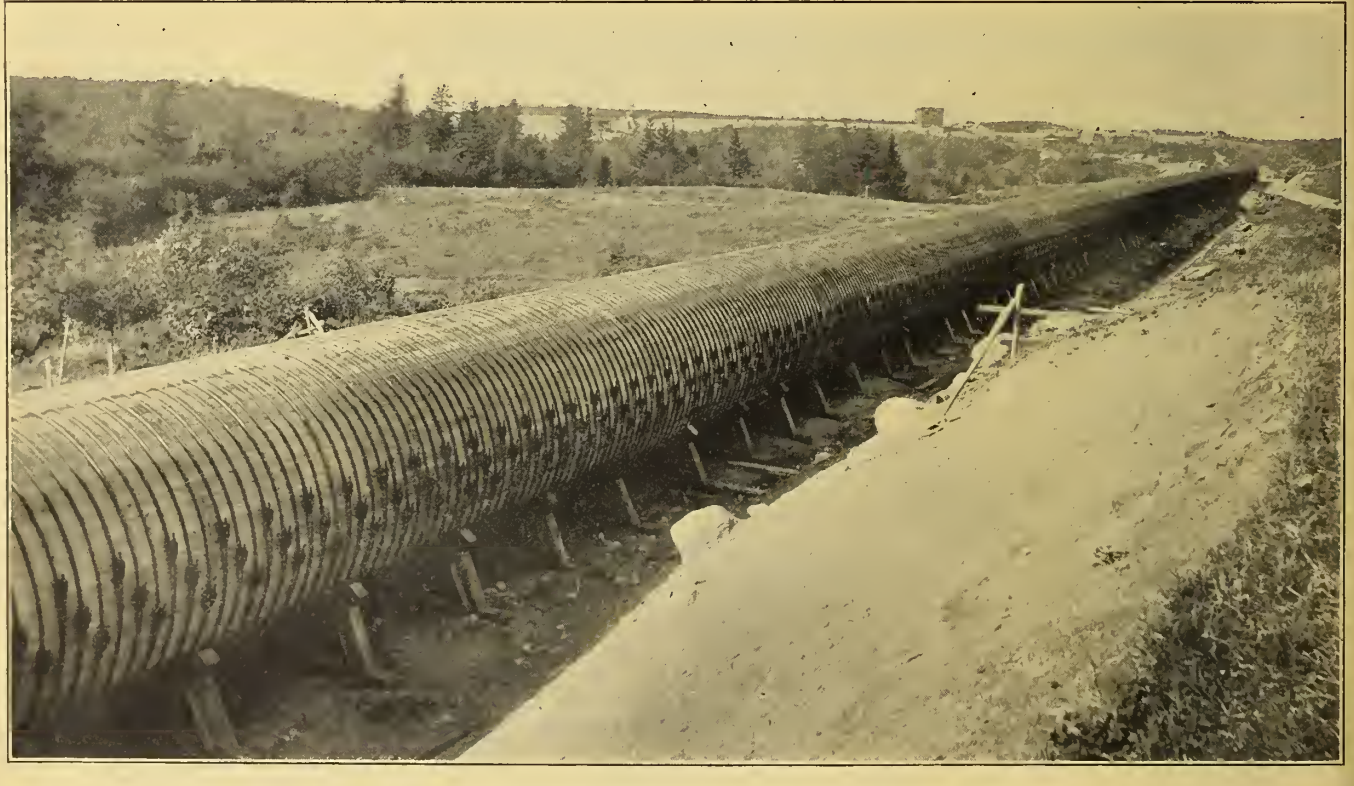
Against gross earnings must be placed the items of:

1.—Interest on first cost.
2.—Depreciation.
3.—Maintenance.

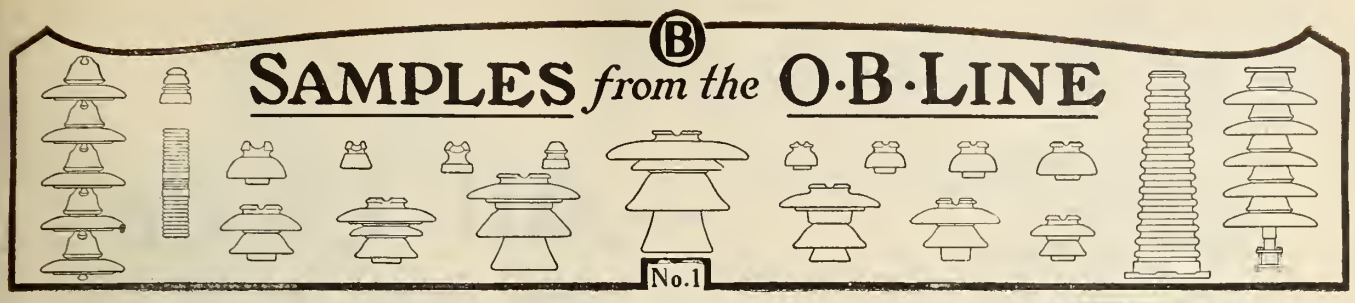
These are at a minimum when Continuous Wood Stave Pipe is used, as shown by the experience of this company on installations throughout Canada, from Nova Scotia to British Columbia. Over 1000 miles of Wood Stave Pipe have been made in Canada by the

Pacific Coast Pipe Co., Limited

1551 Granville St., Vancouver, B. C.



8 Foot Diameter Continuous Stave Pipe, Musquash, N. B. for New Brunswick Electric Power Commission



One-piece Insulators for distribution lines

THE half-scale illustrations show a few of the smaller insulators from the O-B Line.

No. 10387, the unit shown at the top, has a voltage rating of 4000. It is 3¼ inches in diameter and weighs about 14 ounces.

Next below it is No. 9404, rated at 6600 volts. This is a popular insulator, and one on which we can ordinarily make prompt deliveries.

The third sample, No. 9953, also has a general rating of 6600 volts, but is designed primarily for carrying large cables.

The illustration at the foot of the page shows No. 12848, which has a general rating of 11,000 volts.



Every insulator receives the same care as large high-tension O-B Insulators

In Manufacture
Made of wet process porcelain by the same methods used for the larger insulators.

In Inspection
Each piece is carefully inspected to insure highest quality and uniformity.

In Packing
Special attention has been given to developing improved packing methods giving a maximum of protection to the insulator and a convenient package for store room and field use.

All of which means good insulators and best possible performance in an important service.

Dominion Insulator & Mfg. Co. Limited

Manufacturing Ohio Brass Company Products in Canada

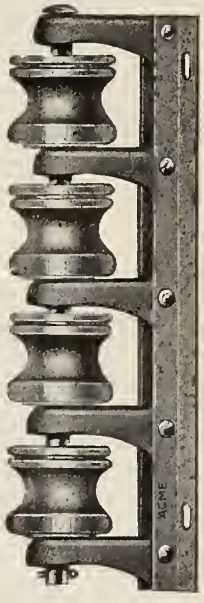
Niagara Falls - - - - - - Ontario

112

Like the A-B-C's
Easily learned—
never forgotten

—All Over
—British
—Columbia

and all over Canada



Peirce
450 Bracket

Electrical engineers everywhere in Canada are using Peirce Pole line Hardware.

They recognize that quality of material and workmanship alone protects the line.

Every piece of Peirce Hardware is sold on quality only—the same from coast to coast.

Always specify

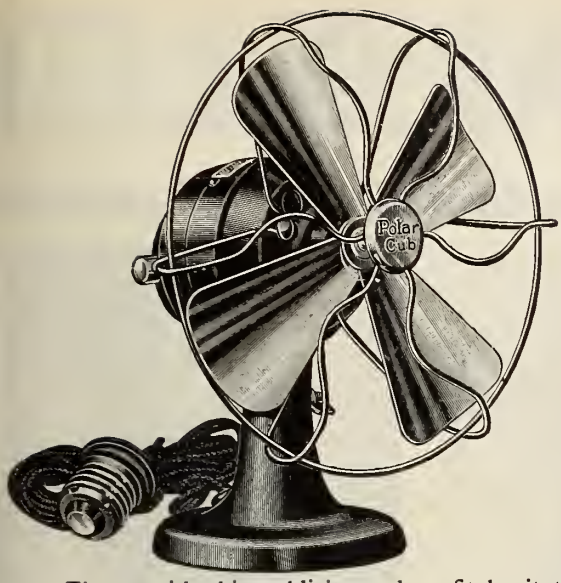
The Peirce

Ask your Jobber

Made in Canada by

N. Slater Co. Limited

Hamilton, Canada



Polar Cub
Electric Fan

"A Season's Guarantee with Every Fan"

All Polar Cubs have the new, improved type of motor, brass blades, new type guard and are guaranteed for the season.

Persistent and persuasive advertising on a larger scale than ever before will bring the merits of Polar Cub Fans and their desirability to your customer's attention.

Tie up with this publicity and profit by it through keeping Polar Cub show cards and display pieces in your window.

Model G—6" Fan	Retails $ 7.50
Model G—8" Black Finish Fan	Retails 10.00
Model G—8" Nickel Fan	Retails 12.00

This trio are hot sellers in hot weather. Keep them well displayed.

The A. C. Gilbert Menzies Company, Limited

439 King Street W. - Toronto, Ont.

Polar Cub Fans — Hair Dryers — Vibrators — Sewing Machine Motors — Radio

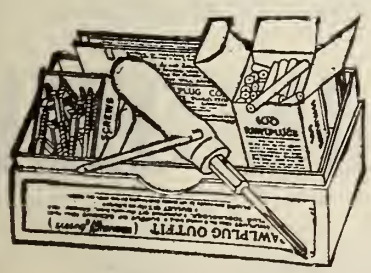
Are you using Rawlplugs?

Rawlplugs save time, money, labor and material. They never fail—because they are made on an entirely new principle that is scientifically correct.

Once in place the Rawlplug holds the screw in a vicelike grip which is unaffected by temperature changes, shocks or other conditions.

Millions of Rawlplugs are now in use and there is hardly a building of any importance being erected today on which they are not used.

Write us for samples and prices.



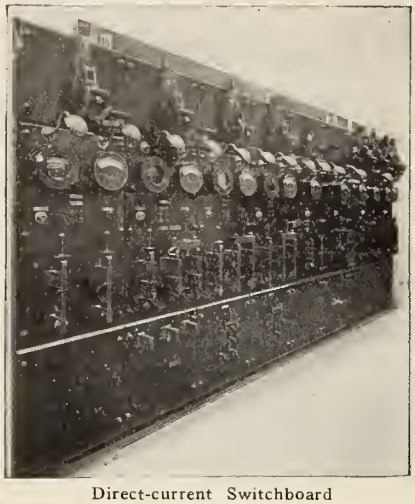
Electricians' Outfit

INVENTIONS LIMITED

Sole Agents for
THE RAWLPLUG CO., OF CANADA
Southam Bldg., Bleury St., MONTREAL

Sales Agents
Dominion Engineering Agency, Ltd., 24 Adelaide St., East, TORONTO
Sterling Specialties, 213 Somerset Building, WINNIPEG, MAN.
H. G. Evans, 58 Water Street, St. John, N.B.
Blackadar & Stevens, 139 Roy Building, Halifax, N.S.
Frank Raw & Co., 325 Howe St., Vancouver, B.C.
Agents wanted in Ottawa

FERGUSON, PAILIN LTD.



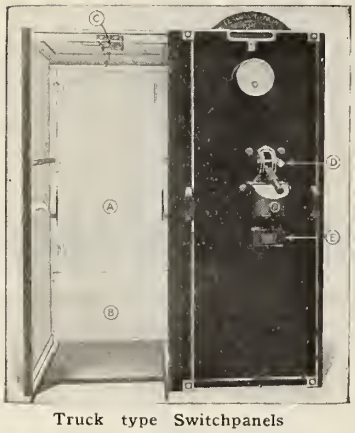
Direct-current Switchboard



Completely Interlocked Ironclad Cubicle



Electrically Operated Oil Immersed Circuit Breaker

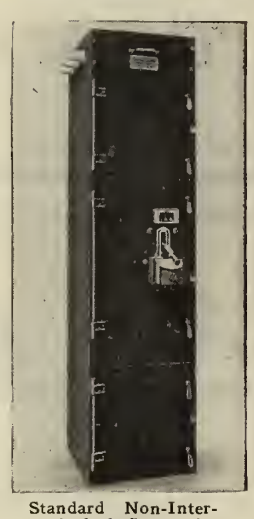


Truck type Switchpanels

We offer a comprehensive range of industrial switchgear designed and manufactured throughout by specialists.

Our designs represent the best modern switchgear practice and incorporate all the most recent improvements.

Made on sound engineering lines and offered at a reasonable price.



Standard Non-Interlocked Ironclad Cubicle

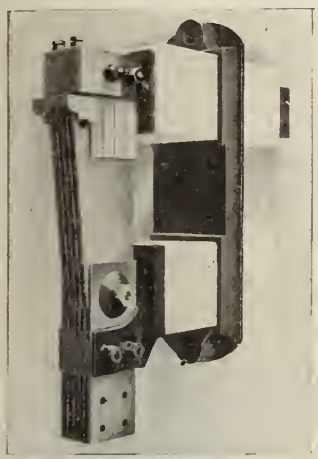
Oil Circuit Breakers, all voltages and capacities for indoor and outdoor service. Heavy Duty Disconnecting Switches and Bus Bar Supports. Truck Type Switchboards and Truck Type Breakers. Series Transformers. Outdoor Disconnecting Switches and Bus Bar Supports. Outdoor Weatherproof and Ventilated Sheet Steel Housings. Indoor Interlocked and non-Interlocked Sheet Steel Factory assembled Switchboards. Ironclad Interlocked mining and industrial equipment. Also agents for Carbon Breakers and Magnetic Blowout Circuit Breakers.

FERGUSON, PAILIN LTD.

Canadian Office and Warehouse:

321 KING STREET EAST, TORONTO, ONT.

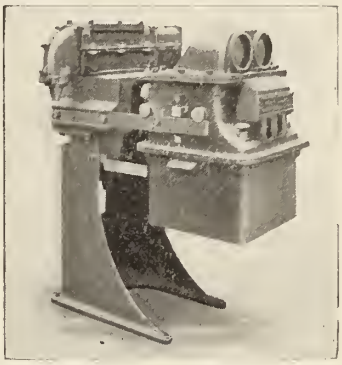
FERGUSON, PAILIN LTD.



Large Current Carrying Capacity Disconnecting Switch



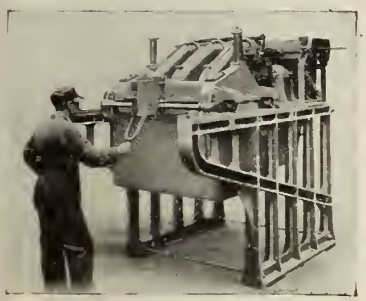
Standard Oil Immersed Circuit Breakers rupturing capacities 35,000/300,000 K.V.A.



Flameproof Oil Immersed Circuit Breaker



Wall Mounting Oil Immersed Circuit Breaker



Type "H" Armourclad Switchgear



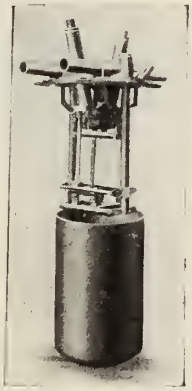
88,000 volt Automatic Air Break Switch (outdoor type)



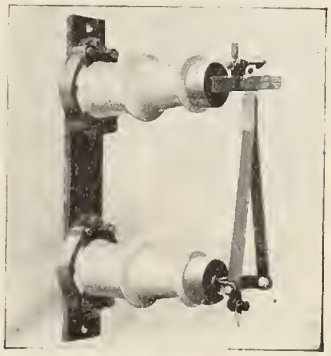
33,000 volt Choke Coil (indoor type)



33,000 volt Condenser Bushing Current Transformer (indoor type).



1,000,000 K.V.A. Rupturing capacity Oil Immersed Circuit Breaker (one pole only)



33,000 volt Disconnecting Switch (indoor type)

As specialists in switchgear we are always pleased to give information on switchgear problems or to advise on projected installations.

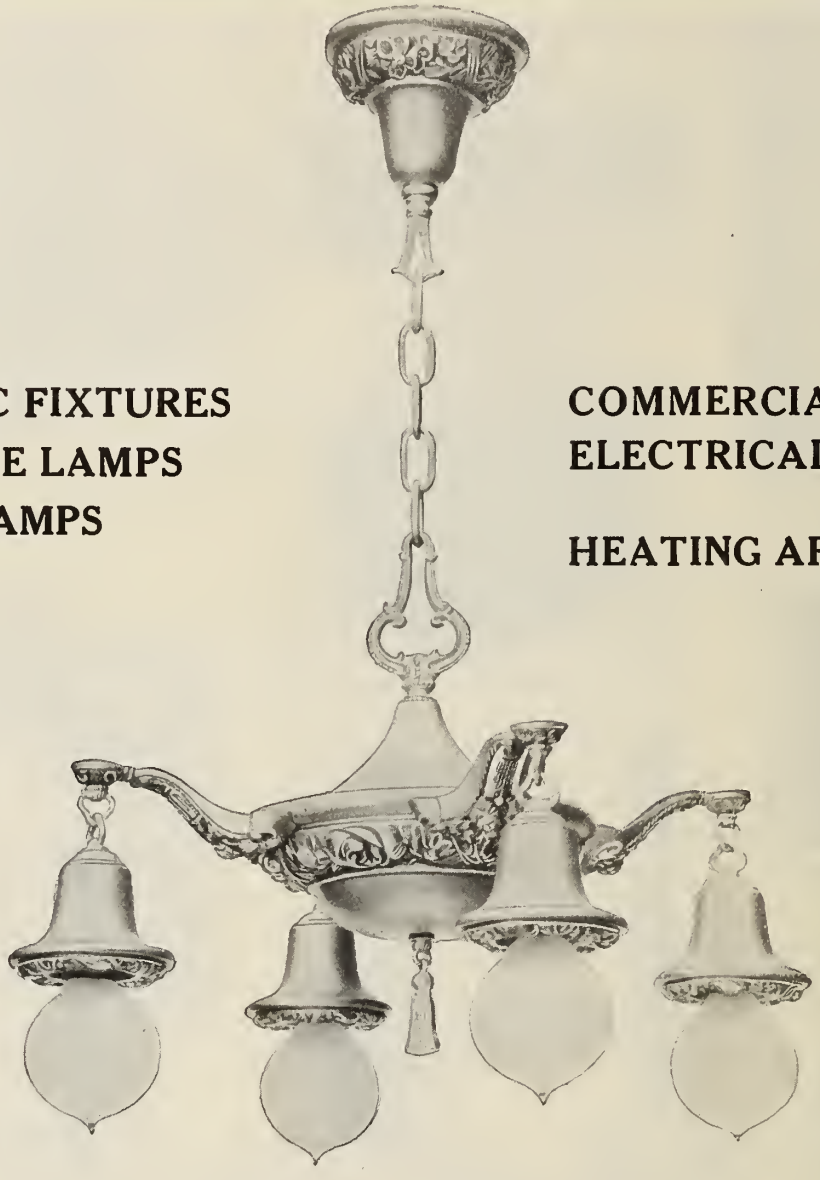
FERGUSON, PAILIN LTD.

Manager:

HERMAN K. ANSINGH

ELECRIC LIGHTING FIXTURES

For Modern Residences



ELECTRIC FIXTURES
PORTABLE LAMPS
FLOOR LAMPS

COMMERCIAL UNITS
ELECTRICAL GLASS-WARE
HEATING APPLIANCES

THE newest creations in Electric Lighting Effects—designs and finishes that are distinctive and exclusive are shown in our new catalog No. 55 E.

Every Contractor and Electric Fixture Dealer will be interested in this catalogue.

Write for Copy.

NERLICH & COMPANY

146-148 Front St. West **TORONTO**

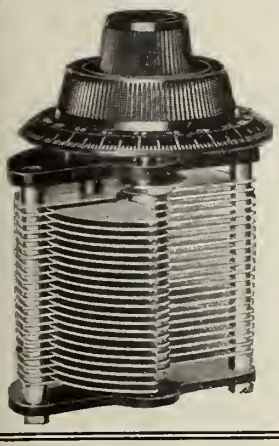
This "UNITED" Audio Frequency Amplifying Transformer Approaches Your 100% Ideal



Is a necessary part of any set that shall bring in signals from any distance, clear, strong, free from whistling or howls, and, is so recognized in the trade.

Magnetically shielded in a shell of our own design. Ratio 5 to 1.
Retail Price - - $4.50

"UNITED" Variable Condensers



are designed for maximum efficiency and largest capacity and resistance to "shorting." They satisfy *everybody* so thoroughly that they have become standard in the industry. Ask for details of our new plate condenser Vernier dial assembly.

United plate condensers are supplied in 43, 23, 11, 5, and 3 plates. Send for lists and discounts of the Quick-Selling "United" line.

UNITED MFG. AND DISTRIBUTING CO.
9705 Cottage Grove Ave., CHICAGO, ILL.
NEW YORK OFFICE, 50 Church St., New York, N.Y.
SAN FRANCISCO OFFICE, 709 Mission St., San Francisco, Calif.

KLITZEN

REGENERATIVE—

Receiving Sets

Real Radio Simplicity

Only one adjustment

Licensed under Armstrong Patents

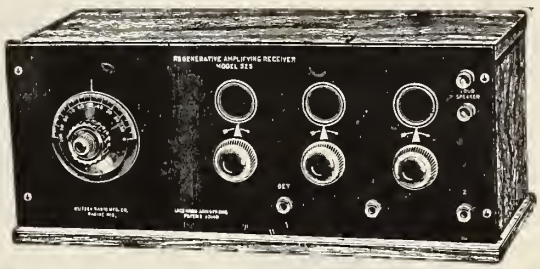
The principal feature of No. 525 Regenerative Tuner Detector, 2-stage audio amplifier is SIMPLICITY.

Any operator can get wonderful results because there is only one adjustment. Receiving Range practically the same as that of the best radiophone equipment on the market.

Each unit carefully tested before shipment. The best material and most highly skilled workmanship employed—it is the product of experts who have been making radio equipment since 1913.

JOBBERS AND DISTRIBUTORS. Write for full information and big discounts. DEALERS—ask your jobber or write us.

KLITZEN RADIO MFG. CO., Inc.
Racine, Wis.



MODEL No. 525

LIST PRICE **$80.00**

Interior Telephones

for

Apartment House, Factory, School, Hospital, Office

Electric Reset Annunciators and Signal Specialties

Hospital Signal System

A complete new silent call system for hospitals. Registers at nurses' quarters and office with time record, if wanted.

Canadian Factory Representatives:

Cochrane, Stephenson & Co. Ltd.
850 Hastings St.
Winnipeg, Man.

Cochrane, Stephenson & Co. Ltd.,
901 Credit Foncier Bldg.,
Vancouver, B.C.

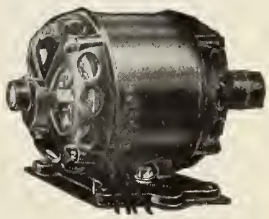
Timberlake & Bourne
New Birks Bldg.,
Montreal, Quebec

The Pierce Electric Company,
104 Richmond St. West,
Toronto, Ontario

CONNECTICUT TELEPHONE & ELECTRIC COMPANY
MERIDEN CONNECTICUT

Century

Fractional Horsepower Type "R S" Induction



Single Phase Motors

Develop a high starting torque with a low starting current. A fuse which will protect the motor while running, is usually of ample capacity for starting, due to the low starting current and quick acceleration.

These are most desirable characteristics as is evidenced by the adoption of these motors as standard by many manufacturers of pumps, air compressors and similar apparatus.

Temperature Rise not more than 40° Centigrade

CENTURY ELECTRIC CO.

1827 Pine Street ST. LOUIS, Mo., U.S.A.

Stock carried in Canada by:
Jones & Moore Electric Co. Ltd., 294 Adelaide St. W., Toronto
Great West Electric Co. Ltd., Winnipeg
Rudel-Belnap Machinery Co. Ltd., Canadian Express Bldg., Montreal
Rankin & Cherrill, 55 Hastings St. W., Vancouver, B.C.

EBY BINDING POSTS INCREASE THE VALUE

of your equipment by increased efficiency and neater appearance.

They eliminate Poor Connections, Damaged Terminals, and Lost Parts. They have larger Contact Surfaces.

Standard Equipment by Leading Manufacturers.

Sold by leading Radio Dealers.



Distributed By—THE WALLACE BARNES CO., LTD. - - HAMILTON, ONT.

Chromel
MARSH ALLOYS

Stands the Heat



It won't scale off. It stands high temperatures better than any other alloy known. It is made in all sizes for Electrical Heating devices. Can you use an element like this?

Write for full particulars.

MADE IN CANADA

HIRAM WALKER & SONS METAL PRODUCTS, LIMITED

WALKERVILLE, ONTARIO.

To Whom It May Concern

Gentlemen.

We respectfully solicit your inquiries for the following:—

Repairs and Rewinding all types A.C. and D.C. Motors. Any type of Stator and Armature coils.

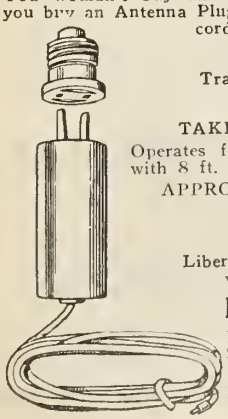
Our deliveries are consistent with necessary time required for proper treating, assuring lasting qualities.

Our Rewinds are backed by a Two Year Guarantee.

Yours respectfully

Canadian Armature Works
Per A. J. Flowers
St. Catharines, Ont.
Telephones: Day 1496 Night 223

You wouldn't buy an automobile without a self starter. When you buy an Antenna Plug insist on one complete with a handsome cord. Buy the original.



Trade "NO AERIAL" RAD-O-PLUG Mark

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Operates from any electric light socket. Complete with 8 ft. cord.
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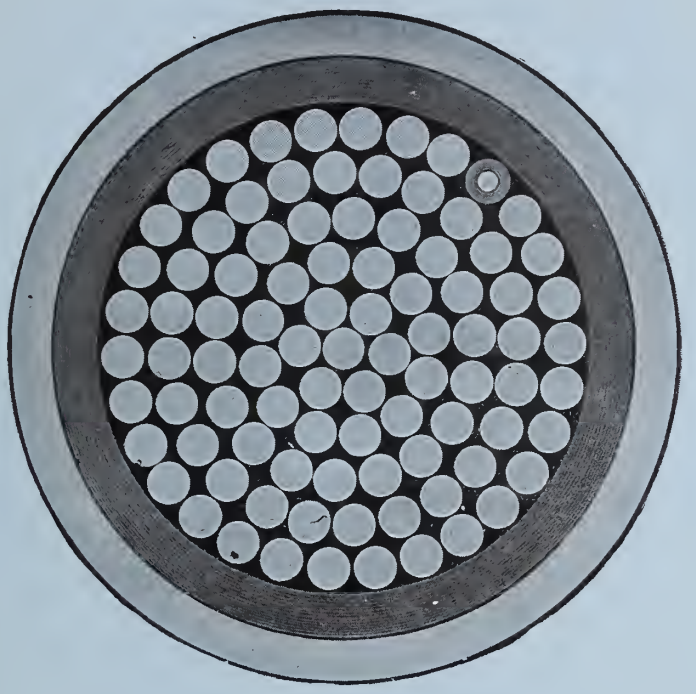
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Manufactured and Installed for the
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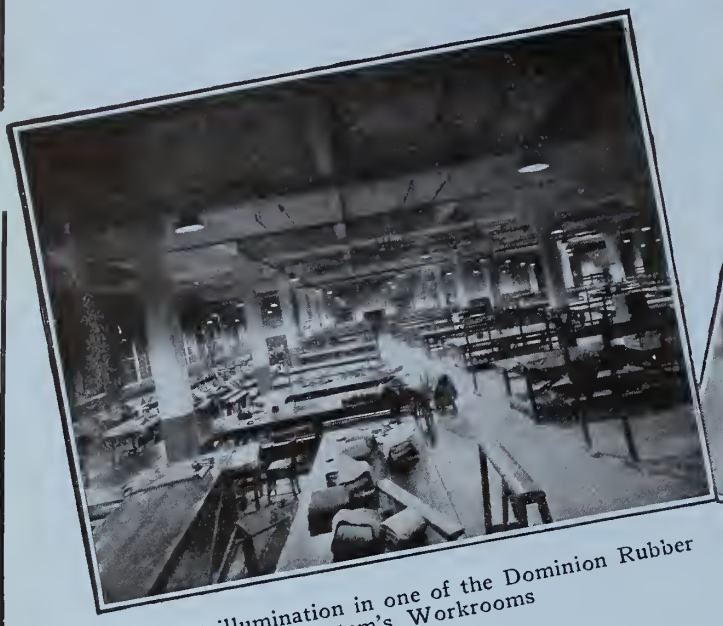
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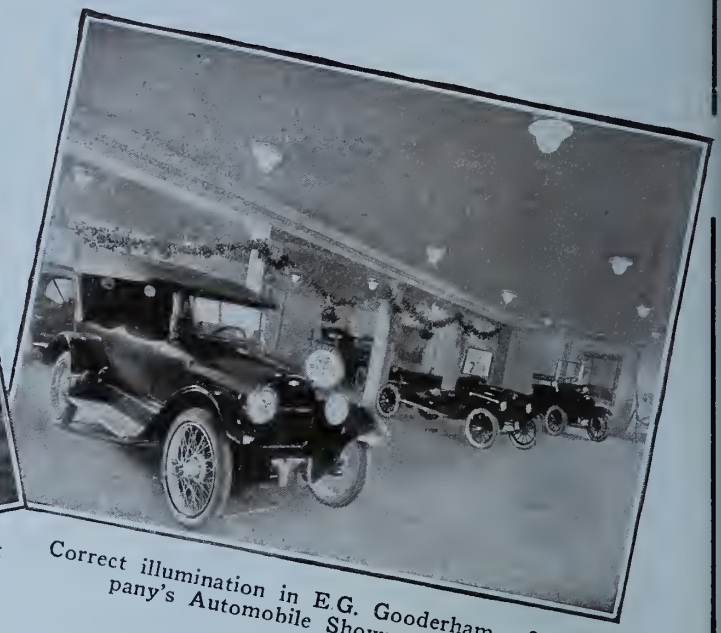
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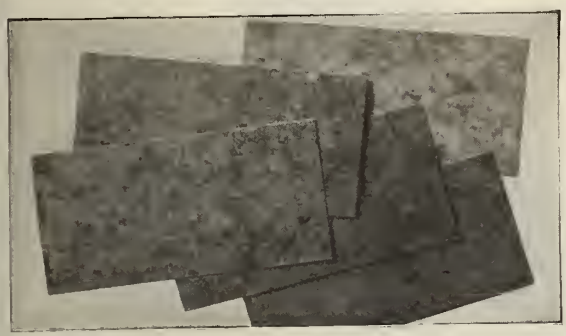
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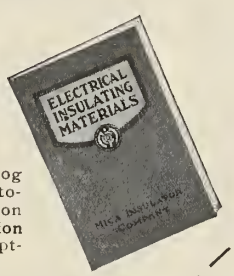
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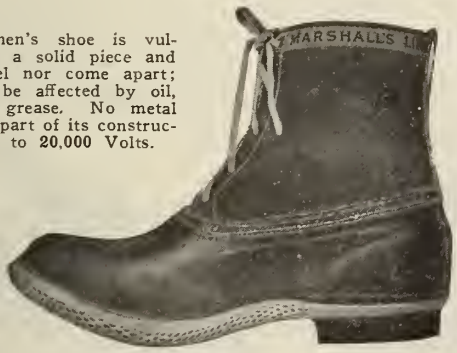
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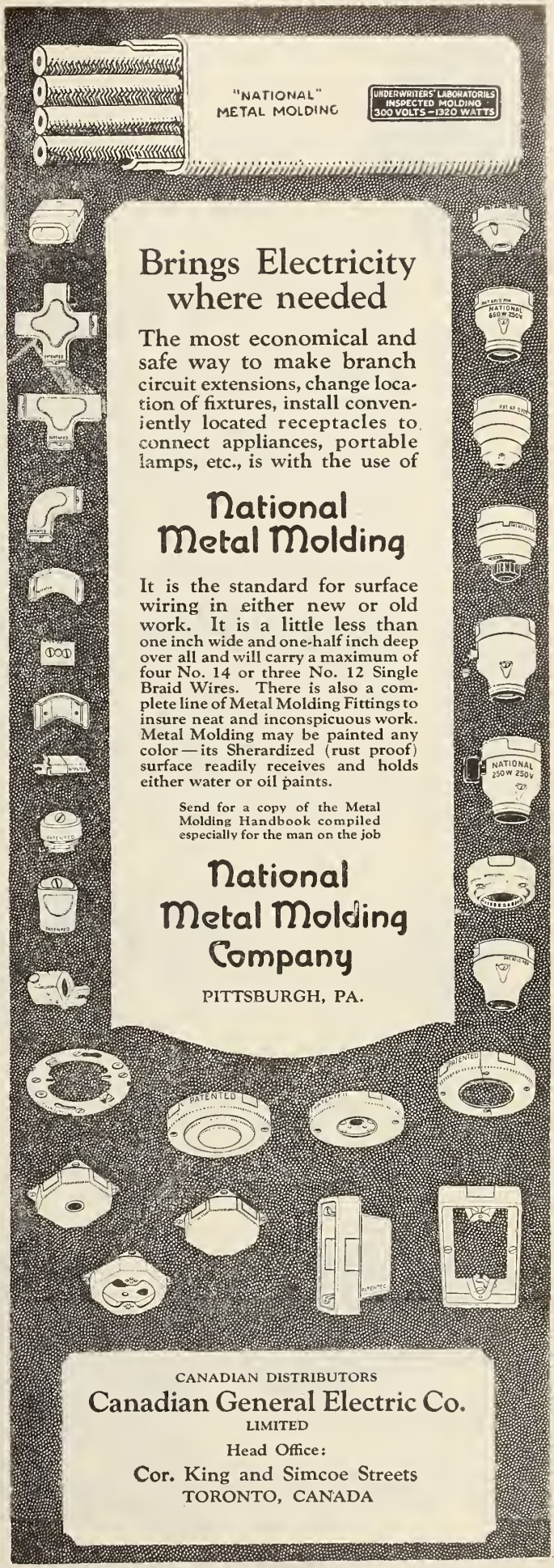
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It is the standard for surface wiring in either new or old work. It is a little less than one inch wide and one-half inch deep over all and will carry a maximum of four No. 14 or three No. 12 Single Braid Wires. There is also a complete line of Metal Molding Fittings to insure neat and inconspicuous work. Metal Molding may be painted any color—its Sherardized (rust proof) surface readily receives and holds either water or oil paints.

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Announcement

We are now completely equipped, by the addition of three new kilns, to supply the electrical trade with the highest grade

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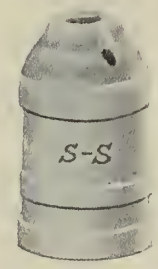
Porcelain Products—including Knobs, Tubes, Cleats, Covers for Conduit Fittings and Specialties.

We also manufacture a complete line of Edison Brass Sockets. We guarantee the utmost care in packing and quick action on all orders.

Service and Satisfaction is our Motto

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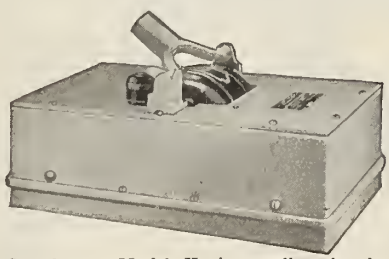
MODEL ——

THE SUN

MADE IN CANADA

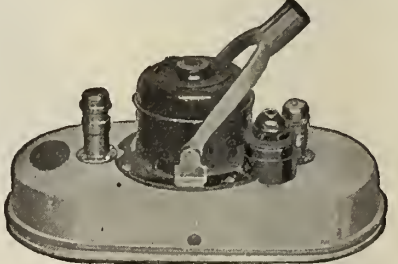
THE Sun Electric Floor Waxer and Polisher is the only machine of its kind, which by its price, weight and ease of operation is adapted for household use.

This remarkable machine takes care of hardwood floors with a minimum of effort. The high speed motor driven brushes by intensive brushing impart a hard, smooth surface, which no hand-work, however laborious, can approach. The "Sun" waxes and polishes hardwood floors, tile floors, cork linoleum, or any other polishable surface.



Our latest—Model K—it supplies the demand of the average home. IT WAXES IT POLISHES.

DEALERS send today for full particulars of our dealer proposition. You can make very attractive profits—EASILY, SURELY and QUICKLY with the Sun Waxer.



Model D
It scrubs, it waxes, it polishes

The Canadian Electric Floor Waxer and Polisher Co., Limited

Note new address: 22 Mark Street, Toronto, Phone Main 4492



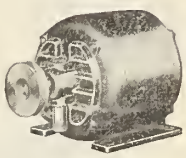
About Demand

Recently we announced production of our new type FA and FD fractional horsepower motors, for washing machines, ironing machines and all other electrically driven household, office and shop appliances—and for general purpose use.

We knew they would be readily accepted by manufacturers and today we are selling them by the thousands—because the motors have proven their downright ability to do their jobs.

These new motors are far superior to any we have before offered—in power for their size and weight, in coolness and quiet operation, in starting and maximum torques, and in all other performance characteristics.

Motor dealers will find the demand for these motors as great among general purpose users as among manufacturers of electrically powered machines. Write us, today, for descriptive literature, and for our motor proposition.



⅛ H.P. AC

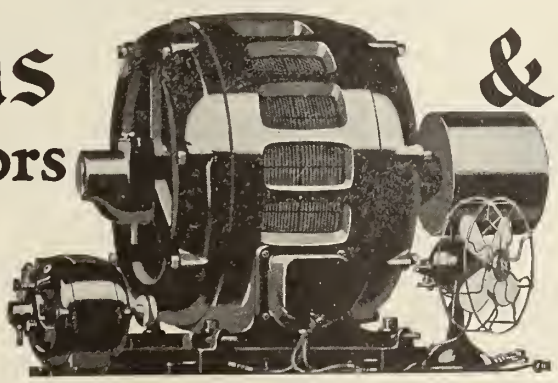
R & M Motors are made in sizes from 1/50 to 150 H. P.

The Robbins & Myers Company of Canada, Limited

Brantford — Ontario

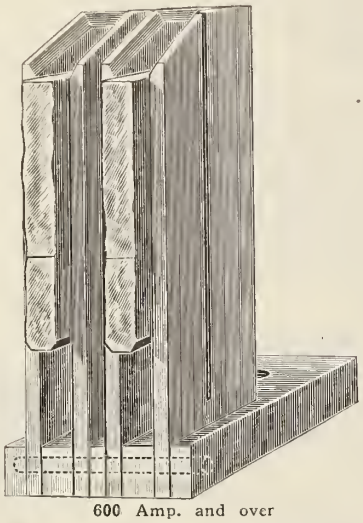
Robbins & Myers

Motors *and Fans*

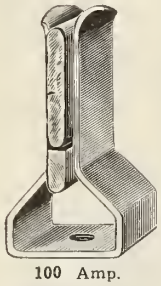


Just some of the reasons why we use

BENJAMIN KNIFE SWITCHES IN OUR SERVICE BOXES BREAK JAWS



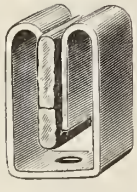
600 Amp. and over



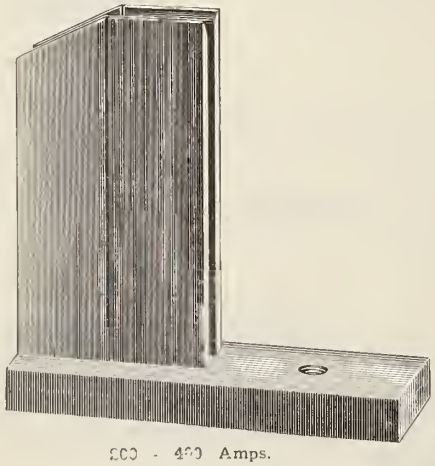
100 Amp.



30 Amp.



60 Amp.



600 - 400 Amps.

BENJAMIN Break Jaws possess the same features inherent in all products bearing the name BENJAMIN—the same large contact surfaces, the same sturdy construction.

BENJAMIN Break Jaws are made from the best grade of hard drawn copper.

The punched clip type of Contact Jaw is used on all Benjamin Switches for service box use up to 100 amperes capacity. This policy has been adopted after a careful consideration of the conditions to be met with in switch boxes for the control of circuits of small current capacity.

However, on switches for service boxes of larger capacities where heavy currents must be interrupted continually without impairing the operation of the service box, Benjamin type "A" knife switch construction is used. This construction is the same as that used in Benjamin Knife Switches for switchboard mounting. The break jaws of this type of switch consist of a milled copper base having the copper jaw blades securely sweated and riveted in place.

Where heavy loads are controlled by a service box the break jaws of the switch must both be large and capable of retaining the contact with the knife blades, under continual interruption of the circuit.

BENJAMIN type "A" construction insures a better and more lasting contact because Benjamin type "A" Break Jaws have "great big" contact surfaces and are made of far harder material than can be used in the "Roll Jaw" type, where a softer copper must be employed in order that fracture of the metal will not occur in the successive forming operations.

Where large currents are interrupted, blistering of the knife blade sometimes occurs. This, however, is practically out of the question in Benjamin Type "A" Knife Switches, due to the Benjamin auxiliary blade type of quick break attachment with its "generous" bevel. Should blistering take place the milled slots in Benjamin Break Jaws produce 75% total contact with the knife blades in ninety-nine cases out of a hundred against that of 50% of the total in the case of the "Roll Jaw" type.

The knife blades and break jaws of every Benjamin Switch for service box use are "ground in" before they leave the factory.

BENJAMIN Type "A" Break Jaws stand "the gaff" better than the "Roll Jaw" type under continual use, and this is why they are to be found in Benjamin Knife Switches, even though they cost more to manufacture due to the fact that much of the work must be done by hand and to the larger number of parts required in their assembly.

BENJAMIN Knife Switches are to be found wherever switchboards are in use. You know their rugged construction. Remember this the next time you need a service box, and demand a "CANADIAN DRILL" Service Box.

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Vol. 32 July 15, 1923 No. 14

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There are a good many reasons why electrical men "stick" to

Tricable Armoured Conductors

but here are a few:

It is the most modern and economical method of protected wiring.

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It makes the best job in the shortest possible time.

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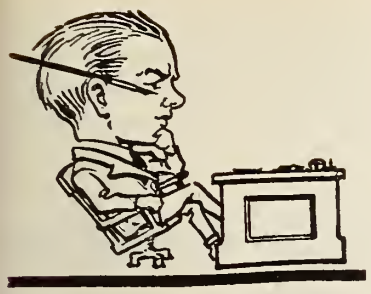
Conduits Company Limited

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Western Agents

COCHRANE STEPHENSON CO.

WINNIPEG - VANCOUVER



The Editor Comments

British Columbia is Land of Power and Promise

The present issue is given over almost wholly to Electrical matters as they concern the Province of British Columbia. Our Coast province is not only rich in resources, but nowhere in Canada does one find the list so completely supplementary—metallic ores with coal, lumber and water power.

The province has been exceedingly fortunate from the beginning in having attracted to it a vast amount of capital interested in development. The British Columbia Electric Railway Comany, is of course the largest of this class but their investment of British capital is now in the neighborhood of sixty million dollars. This company has been liberal in its extensions to an extent that was only justified by that unconquerable western optimism of which we hear so much in the East and which we have come to hold in high esteem. Other companies have also poured out their capital freely so that at no stage has the development of the natural resources of this province been hampered for lack of power.

The attempt to cover the electrical operations within the covers of one number of the Electrical News must necessarily mean that we treat only of typical cases. We trust however, that this issue will play a part in bringing to the minds of our readers all over Canada a realization of the wonderful resources and resourcefulness of our brothers in the far west, from whom we are divided only by distance—and distance, electrically, does not exist.

Why Not Three Conventions at Once?

The Canadian Electric Railway Association held a most successful convention during the last week in June, in Toronto. Space in this issue does not permit extended mention of the meetings, but the proceedings will be reported at some length in our next issue.

The fact that the meetings were held in Toronto, doubtless added interest from the average delegate's viewpoint, on account of the large amount of new work that has been carried out during the last couple of years by the Transportation Commission. The Toronto Railway System now compares favorably with the best transportation system on this continent.

A feature of the convention was again the display of traction equipment—for which the Exhibition buildings provided ample space. During one of the discussions the suggestion was thrown out that an effort be made to hold all the electrical conventions at the same time so that the manufacturers would only be required to make one exhibit instead of three, as at present. They would then doubtless feel justified in making that one exhibit more complete and pretentious. The suggestion seems to offer great possibilities.

Power Demands of the Mines in Northern Ontario

"An eager reach for power, and more power" is the way one observer describes the electrical situation in Northern Ontario. His impression is derived from an extensive survey which included every considerable plant in the whole North Country.

This lust for electric service is legitimate and inevitable. The established companies, whether mining or otherwise, are now producing in greater quantities than ever, and a surprising number of new projects are opening up. No one wants to drag a Diesel or a steam engine over bush roads, into a property that will eventually be electrified.

The effect of this demand is directly seen in the completion of the Indian Chutes plant of the Great Northern Power Company, on the Montreal River, which will ultimately have a capacity of over 7,000 horsepower, the Sturgeon Falls plant of the Northern Canada Power Company on the Mattagami River with a capacity of 9,000 horsepower and the construction work for the Des Quinze Power Company on the Quinze River, where a 20,000 h.p. plant will be installed. Other projects are also under way, including a large plant on the Abitibi for the Hollinger mine, and an additional plant for the Wahnapitae Power Company, near Sudbury. Several large developments for paper and pulp companies have also been completed.

The immense difficulties encountered in the construction of these northern power plants, must be seen to be appreciated. In first place comes the tremendous labor involved by the overland transport of machinery, nearly always necessary to some extent. Then follow a host of minor troubles—the danger of fire, the inconvenience of being far from a base of supplies, the lowering of efficiency by insect pests,

the difficulty of running transmission lines in rocky country, the necessity of organizing and running an isolated camp, and so on almost without end.

It is a marvellous thing that these difficulties are solved as they come up, as a part of the day's work, by our Canadian engineers. We have the "goods," in the shape of both water-powers, engineers and resources, and the combination of the three in Northern Ontario at the present time heralds an unprecedented burst of development.

British Columbia Holds a Proud Place Among the Electrical Provinces of the Dominion of Canada

In the central station industry in Canada, British Columbia stands easily in third place among the provinces. According to the latest census returns the total capital invested in central station operations in Canada is $448,273,642. The percentages of capital invested are divided among the various provinces as follows:—

Ontario, 45.51%; Quebec, 33.32%; British Columbia, 9.93%; Manitoba, 4.12%; Alberta, 2.48%; Saskatchewan, 1.58%; Nova Scotia, 1.31%; Yukon, .31%; Prince Edward Island, .09%, so that British Columbia's expenditure is $44,507,332.

The total number of generating stations in British Columbia is 50, of which 30 are hydro-electric and 20 fuel. Of the 20, 13 are steam engine driven and 7 are gas or oil engine driven. There are also 8 so-called non-generating stations, that is, stations where power is purchased in bulk for distribution purposes, but where none is generated. The amount of capital invested in private commercial stations $41,890,954, and in municipal stations $2,616,378.

According to the same census the total amount of power being generated in Canada (this was in 1920), was 2,033,616 h.p. Of this amount British Columbia contributed 11.81% or 240,089 h.p. The water-wheel capacity was given at this time as 206, 921 h.p.; the steam engine at 33,913 h.p.; the gas and oil engine capacity at 2,255 h.p.

The Men in High Places are Optimists

No Cessation in Electrical Demand

By George Kidd, President, B.C.E.R. Co.

Statistics compiled by the Water Rights Department of the Provincial Government show that the total possibilities of hydro-electric power in British Columbia is about 3,000,000 horse power. Of this only a small proportion, or a trifle more than 10%, has been developed. Hydro-electric stations have developed 207,000 h.p. for sale; pulp and paper mills have developed 49,000 h.p., and an equal amount has been developed by mining and other industries. A considerable part of the Province is of a mountainous nature and some of the potential sources of supply would be costly to develop, but there are many others which could be developed at a moderate cost.

The outlook for the demand for and supply of electrical power is exceedingly favorable. Mining is an industry which is capable of using vast quantities of electrical power. It is, however, practically speaking, only in its infancy, although it is making rapid strides, as is evident by the increased output from year to year. The establishment in the near future of many pulp and paper mills, which are also large consumers of electrical power, is practically assured, for, with the depletion of the resources in the United States for the manufacture of pulp and paper, British Columbia is now being more favorably looked on as the principal source of supply for these products in the future.

There are one or two factors which to some extent retard the establishment of industrial plants at the present time. Taxation in the Province is high and this can only be remedied by increased population. With this end in view the Government has embarked on an immigration scheme for the extensive settlement of the agricultural areas of the province, which have not yet developed. Another very prominent issue at the present time is the question of equalization of freight rates and in this direction it is expected that relief will be afforded in a short time. Just as soon as remedial action is evident in respect of these two issues, there will be greater industrial activity and consequently a large increase in the demand for electrical power.

Vancouver as a Seaport

As a seaport Vancouver is making rapid progress. Government returns indicate large increases in the value of imports and exports. It has been found neecssary to materially increase the harbour facilities—grain elevators are being enlarged and constructed and drydocks are in the course of construction. This development work creates a large demand for power. The Harbour Commissioners are considering plans for the construction of an electrically operated railway to serve the whole of Vancouver's waterfront.

No Cessation in Electrical Demand

There is no cessation in the demands for extensions of our distribution system and for additions to our commercial load, and as evidence of our faith in the future we have recently increased our storage capacity at the Stave Falls plant at a cost of over $1,000,000, and installed an additional 13,000 h.p. unit.

We have now under consideration plans for the construction of another plant at a cost of approximately $10,000,000, which would increase our present generating capacity by 115,000 h.p.

Various Industries Flourishing

By T. H. Crosby

Sales Engineer, Canadian Westinghouse

In considering conditions in the electrical field in the West, it is well to examine the industry, not so much as to its component parts, and from that view-point to form a composite opinion, but to view it from the standpoint of the various base or prime industries of the district. By examining these industries, we will the better see the real condition of our particular industry. We will also see a reason for a very considerable degree of satisfaction with present conditions.

Here, electrical industry is quite dependent for its progress and prosperity upon the more fundamental or prime industries of the country. This is of course true in all districts, as the benefits derived from the extended use of electricity reach all branches of industry and of social life. However, Western Canada is as yet chiefly concerned with raw, or at least only partially manufactured products, and in British Columbia the bulk of these products come from fishing, lumbering and mining.

The fishing industry has been and is now, in places, quite profitable, and contributes not a little to the total income of the Province. This industry, while important to the Province, has not been conspicuous in its use of electrical energy, apparatus and appliances. Outside of the energy required in the up-to-date refrigeration plants, electricity serves this industry only through small lighting installations and very small power units.

Lumber Industry Flourishing

The lumber industry is today in a very flourishing condition. There is a stiff demand for logs and lumber with many mills working overtime on back orders. This satisfactory condition of the largest and most conspicuous industry, in and about Vancouver, has every appearance of continuing for a considerable period at least. A wider field of marketing is making far steadier operation, and is creating a greater tendency upon the part of the timberman and the lumberman to pay more attention to the details of economical and efficient operation.

The various operations in the manufacture and handling of lumber require power in very considerable quantity. So, therefore electricity plays an ever increasing part in the lumber mill, the planing mill, the sash and door factory and the other plants connected with the manufacture and handling of lumber. Several mills are at present adding to their electrical station power in spite of the very low costs of power which can be produced from wood waste in the lumber mill.

The healthy condition of the lumber market is just beginning to make itself felt through the various channels of trade. So with this steady export market for lumber and lumber products we will find that electrical trade conditions will benefit by business from all the other avenues of business which are only indirectly effected by lumber.

Electricity in Mining

Mining operations in this Province, are large users of power whether the mines themselves produce coal, or metals. Practically all these mines use electricity for the various operations in mining, concentrating, or smelting of the ores. The conditions under which the electrical equipment is forced to work causes relatively high maintenance and replacement costs. Therefore, the mining industry, which is steady as regards the production of coal, and quite stimulated due to steadier and more satisfactory market prices, as regard the metal mines, is directly a very considerable contributor to the welfare of the electrical industry.

Indirectly, the mining industry contributes still more as a number of the smaller cities are supported almost wholly by the mines and the larger centres get a very considerable portion of their business from the same source.

Many Specific Developments

To pass from these general conditions to specific developments, improvements and extensions to works, there are quite a number that may be mentioned. The B. C. Electric Railway Company on the mainland is completing an extension to their Stave Falls plant and very largely extending the storage facilities at this plant. Plans are rapidly maturing for additional plants in connection with this development. These extensions are necessitated by the increase in the use of electricity and directly shows a fundamentally healthy condition underlying electrical work. The B. C. Electric Railway are now building a twenty-two mile transmission line to Britannia Beach, where central station power will operate the mines and mills of the Britannia Mining and Smelting Co., Limited.

On Vancouver Island the same power Company is planning a considerable extension to their power system, by running a transmission line up the east side of Vancouver Island, probably as far as Nanamio, some seventy miles from Victoria. This will make for a greater use of electricity in the towns in this district and will provide electric service for a number of rural districts that are now without service.

The West Kootenay Power Company is planning an extension to its plant at Bonnington Falls as its

present capacity is being fully used. This power company's output is used chiefly in the mining and smelting industries.

The East Kootenay Power Company whose plants and distribution lines are east of Kootenay Lake in the southeast corner of the province, is constructing its second plant at a point near Elko. This extra capacity is required by mines in this district, the chief user being the concentrating mill in connection with the Sullivan Mine at Kimberley.

Other New Work

Additions are being made at the present time to the generating capacity at the plant of the Pacific Mills Co. at Ocean Falls where they operate a large paper mill, and at the power plant of the Granby Consolidated Mining, Smelting and Power Company, Limited at Anyox. The power from this plant is to be used in the extended mining, milling and smelting operations, of this concern.

Considerable new electrical work is also being carried out in connection with reclaimation and irrigation work for the benefit of various farming districts. Many tracts of land that can be irrigated are small in area and here the electric motor with centrifugal pumps is far more attractive than the installation of a gravity system with high initial cost and indeterminate expenses for up-keep.

With these various outlets for electric power apparatus and appliances in this province, the electrical industry is on a sound basis and while on the one hand there is not an extreme amount of activity nor indications of a "Boom," there is on the other side no lack of evidence that steady progress will be made. We therefore can look upon the present conditions of the industry as satisfactory, especially in view of continued expansion that will follow the increasing amount of shipping on this Coast and the increasing movement of grain through the Western gateways.

During the construction of the Dominion Government Ballantyne pier, 1,617 h.p. of electrical energy were used on construction work. The pier will be operated entirely by electric power when completed. The equipment will include travelling and fixed derrick cranes, escalators and elevators.

The electric home at Windsor, Ont., proved a huge success. Visitors were admitted daily, from 2 till 10 p.m., and a record attendance was secured.

A recent issue of the Quebec Gazette announces the incorporation of the Champlain Hydraulic Co. Limited, with a capitalization of $50,000. The company is licensed to carry on the business of an electric light, heat and power company within the districts of Montreal, Three Rivers, Quebec, Joliette and Saint Francis.

Can Anyone be Other Than Optimistic?

By A. B. Sanborn

Gen. Man. East Kootenay Power Co.

Mr. A. B. Sanborn, general manager of the East Kootenay Power Company, Limited, Fernie, B. C., writes that he is "Most optimistic in regard to the electrical prospects of British Columbia. It is said in the ordinary span of human life that the first forty years are the hardest. In central station life the reverse is true. The central station usually supplants numerous small power plants whose cost of production is high, and therefore the cost of electric power in the communities is high. The central station offers a service at a reasonable figure. Is it any wonder that the electric industry immediately booms upon the entrance of a central station in the field? Equipment and appliances that have been dormant suddenly awaken to renewed life; more house wiring is done; more people are benefitted;—in fact the industry as a whole—in the community—takes on renewed vigor.

"This is the present state in this locality, and of the future, can anyone be other than optimistic? The future of the electrical industry depends entirely upon the commercial future of the district served.

"This country is rich in coal and mineral resources of all kinds and in the 'Initiative of the individual.' The combination makes for success."

Some Recent B.C.E.R. Appointments

Mr. George Kidd, general manager of the British Columbia Electric Railway Company, Vancouver, B. C., has been appointed president of the company by the board of directors at a recent meeting in London, England; W. G. Murrin, assistant general manager has been appointed vice-president and A. T. Goward, manager of the Vancouver Island system has been appointed vice-president at Victoria. These changes are the result of the recommendations of Sir Ernest M. Harvey who made a recent visit to the company's properties in British Columbia, so that the titles of the executive officers would more clearly define their powers and responsibilities. No change in duties will take place, Mr. Kidd remaining in charge of the company's entire policies and holding power of attorney from the board of directors in London; Mr. Murrin in charge of the actual operations on the mainland of British Columbia and Mr. Goward in charge of operations on Vancouver Island. Mr. R. M. Horne-Payne is chairman of the board of directors as before. Mr. Murrin returned from a visit to England on July 14.

Power from Eugenia is expected in Paisley Ont., by August 1.

The B.C.E.R. Co. a Dominating Factor in the Province's Electric Life

With Sixty Millions of Dollars Invested in Power Plants, Distribution Systems and Electric City and Interurban Railways

Electric light and power service, street railway and electric interurban transportation service and gas service in Vancouver and the lower mainland are provided by the British Columbia Electric Railway Company, a company which has invested $60,000,000 of English capital in the Province of British Columbia.

Light, power and railway service is given on the mainland over an area of 80 miles long and 40 miles deep and the company has the distinction of having the largest mileage of electric railway track in the Dominion of Canada and of operating the longest electrical interurban line in the Dominion, namely, from Vancouver to Chilliwack, 76 miles.

The electric power is obtained entirely from water power, there being three hydro-electric plants on the Mainland and two near Victoria on Vancouver Island. On the Mainland, the network of high-tension and distribution lines reaches practically every urban, suburban and rural district in the territory.

In the cities of Vancouver and Victoria and their immediate suburbs gas is also supplied by the British Columbia Electric Railway Company.

The Railway System

The railway system of the B. C. Electric Company comprises no less than 376 miles of track, of which 112 miles are in Vancouver and suburbs, 162 miles in the various interurban lines on the Mainland, 10 miles in North Vancouver, 23 miles in New Westminster and the remainder in Victoria and its suburbs.

Four interurban lines operate out of Vancouver. The Central Park line between Vancouver and New Westminster, a distance of 12 miles, carries more than 300,000 passengers a month. Another interurban line runs to Steveston, 12 miles from Vancouver, tapping a densely populated suburban district on the way.

The B. C. Electric Railway Company operates 396 passenger cars and has in addition extensive equipment for handling freight. There are 18 freight locomotives and 423 freight cars and 13 express and baggage cars.

The First Hydro Plant

Hydro-electric power was first generated on the Pacific coast of British Columbia in 1898 when the British Columbia Electric Railway Company put in operation a small plant of 700 horse-power at Goldstream near Victoria. It was not until 1903 that hydro-electric power was available for Vancouver. The first installation made by this company on the Mainland was at Lake Buntzen and since then owing to the enormously increased demand for power, the company has two plants at Lake Buntzen with a total capacity of 64,000 horse-power. Ample as the company construction plans were in the days of great expansion, they were not enough to cope with the development of Vancouver and several years ago the company took over the plant of the Western Power Company of Canada at Stave Falls and since then by the installation of an additional unit, has brought its generator capacity up to 47,400 horse-power. With the steam reserve plant of the company at Vancouver, this makes available no less than 128,200 horse-power of electrical energy in the lower Mainland. On Vancouver Island there is an additional 29,900 horse-power, making a total of 158,100 horse-power developed by this company.

British Columbia is essentially a province well endowed with hydro-electric resources and has a record of having more water power developed per capita than any other province in Canada.

To make available this power to the far ends of the lower Mainland, there are 217 miles of 34,600 volt and 60,000 volt transmission lines, 15 substations, 40 transformer stations, and 1,230 miles of distribution lines.

Indicative of the wide spread use of electrical power in and around Vancouver, it may be said that with a population about 224,000, this district used in 1922 a total of 264,183,322 kilowatt hours of electricity.

There is hardly an industry on the lower Mainland, with the exception of some lumber mills, having waste fuel, which does not use electric power purchased from the central station company as rates are so low that it is not profitable to generate power in private plants.

Great Promise for Industry

Industrial progress during the next few years promises to be so great, however, that immediate plans are being taken by the B. C. Electric Company to increase its power output. The addition of one 13,000 horse-power unit last year is expected to be used up before 1924 and the construction of other units must be begun almost immediately. The company has available at Stave Falls a further 115,000 horse-power, which will be developed as required. At the present time there is nearing completion a

project costing $1,000,000 for raising the dam and thus starting an additional quantity of water which will increase the kilowatt hour output of the plant by 50 per cent.

There is believed to be a tremendous development of industry approaching in the province of British Columbia. Vancouver, during the last two or three years, has been born as a great wheat shipping centre and two great elevators are projected for immediate construction. A new bridge across the Second Narrows costing $1,500,000 and a floating drydock are to be constructed immediately. A paper mill recently started operation in New Westminster, and a pulp company is planning to be established on the north shore.

This company recently contracted to supply the Britannia Mining and Smelting Company with a minimum of 4,500 horse-power for operating its copper mine at Britannia Beach, 30 miles from Vancouver. A high tension line costing $175,000 is under construction. Another high tension line costing $150,000 is being constructed from the company's Lake Buntzen plant as an additional safeguard to the power supply of Vancouver, and plans are out and contracts let for an additional substation in Vancouver, costing $65,000.

In addition to supplying the lower Mainland with all this electrical energy, the B. C. Electric Railway Company exports to Bellingham, Washington, some 8,000 kilowatts to augment the local supply.

Current Costs

Domestic lighting costs 5 cents a kilowatt hour in Vancouver city and 6 cents in the surrounding municipalities. Commercial lighting is on a similarly low scale and power for large industries is sold at rates which average as low as 8/10 of a cent a kilowatt hour. So universally has electricity been adopted with this system that 95 per cent of the houses in Greater Vancouver use electricity for lighting. It is the exception to find a house not wired for electricity and these are only to be found in the country districts. In fact in many cases houses will be wired for electric lighting long before there are any wires in the vicinity.

The Fraser Valley is a large and prosperous agricultural district adjacent to Vancouver and is supplied with both power and interurban service by the B. C. Electric Railway Company. Chilliwack is a thriving center for farming operations and near this is now being completed the Sumas Reclamation Scheme whereby the provincial government will bring under cultivation 30,000 acres of rich land, which have hitherto been under water at least part of the year. When this is completed, the land will be divided into 40 acre plots and the settlement of this area will give tremendous impetus to agriculture on the lower Mainland. There are similar possibilities in many other places along the Fraser Valley.

The head office of the British Columbia Electric Railway Company for British Columbia is at Vancouver, the general manager being George Kidd, and the assistant general manager, W. G. Murrin. A. T. Goward is manager at Victoria.

Total Power Generated

The total amount of power generated by the hydro-electric plants on the Mainland for the last ten years is as follows:

1913	173,335,646	kilowatt	hours
1914	159,926,320	"	"
1915	140,734,825	"	"
1916	147,748,265	"	"
1917	162,767,040	"	"
1918	166,745,610	"	"
1919	192,839,680	"	"
1920	251,445,600	"	"
1921	240,020,079	"	"
1922	264,183,322	"	"

It was not until 1921 that the company obtained control of the Western Power Company of Canada. Prior to that time the two companies had separate distribution systems, but a large portion of the Western Power Company's energy output was purchased in bulk by the British Columbia Electric Railway Company. The above figures include the total output from the Western Power Company of Canada's plant since 1913.

The total horsepower connected for industrial purposes on the Mainland system for the past ten years was:

	Motors	Horse-power
1913	3,117	34,583
1914	3,190	35,169
1915	3,264	35,765
1916	3,421	37,692
1917	3,673	40,272
1918	3,920	43,728
1919	4,180	48,072
1920	4,585	53,934
1921	4,876	57,583
1922	5,131	59,699

The total number of light and power consumers supplied by the company on the Mainland has increased in the last five years as follows:

1918	Total	consumers	58,100
1919	"	"	62,000
1920	"	"	64,190
1921	"	"	67,999
1922	"	"	73,956

The present generating capacity of the various plants, expressed in kilowatt amperes and the equivalent horsepower, is as follows:

	K.V.A.'s	Horsepower
Mainland		
Lake Buntzen, Plant No. 1	21,000	28,200
Lake Buntzen, Plant No. 2	26,700	35,800
Stave Falls	35,300	47,400
Vancouver Steam Plant	12,500	16,800
Vancouver Island		
Coldstream	2,200	3,000
Jordan River	16,000	21,500
Brentwood Bay Steam Plant	4,000	5,400
	117,700	158,100



3-car train on Fraser Valley interurban line of B.C.E.R. Co.

A Brief Description of the Plant of the B. C. E. R. Company

Lake Buntzen, Jordan River and Stave Falls Generating Plants Very Modern and Efficient — Three Hundred and Seventy Six Miles of Railway Trackage

The most important factor in the electrical industry in British Columbia is the British Columbia Electric Railway Co. This company controls the electric railways both in the Vancouver district and on Vancouver Island and operates a number of large hydro electric plants chief of which are outlined briefly below:

Plant No. 1, Lake Buntzen

The original power house known as Lake Butzen Power House No. 1, is situated on the east shore of Burrard Inlet about 16 miles from the City of Vancouver.

The power house is built of hewn granite, the main floor being 5 feet above high water. The original installation has been added to from time to time, and the present equipment is as follows: 4—1,500 kw. Westinghouse generators driven by Pelton water wheels; 1—5,000 kw. Canadian General Electric generator driven by Pelton water wheels; 1—5,000 kw. Dick Kerr generator driven by Doble water wheels; 1—5,000 kw. Canadian General Electric generator driven by Doble water wheels.

All of the above units are of the horizontal type, the water wheels and generator being in all cases mounted on the same shaft. In addition to the above equipment, four exciter units are provided.

All of the generators are of the three phase, 60 cycle type generating current at 2,200 volts. For regulation purposes Tirrill regulators are provided. The generating equipment is installed on the main floor of the power house, 5 feet above high water level. The operating bench board and switch board are placed on the galley along the back wall of the generating room. Behind the switchboard the generator switches are situated and on the floor above these are placed the low tension transformer switches.

The transformers and high tension switching equipment are housed in a separate building behind the power house. The transformer equipment consists of three banks of three 3,000 kv.a. single-phase, oil insulated, water cooled transformers which step up the voltage from 2,200 to 34,600. This voltage will be increased to 60,000 at an early date. Electrolytic lightning arresters are placed in concrete shelters on the roof of the building. The high tension switches are of the K-15 type and are placed in a separate room behind the transformer compartments. All of the equipment in the transformer house was supplied by the Canadian General Electric Company.

Each of the 1,500 kw. units in Power House No. 1 is supplied with water from Lake Buntzen by means of a pipe line 48 inches in diameter and 2,000 feet in length. Two pipe lines 60 inches in diameter are provided for the fifth unit. One pipe line 84 inches in diameter at the upper end and tapering to 72 inches in diameter at the power house, is provided for the sixth unit, and a similar pipe line provides water for No. 7 unit.

In the original installation the first 800 feet of the pipe lines below Lake Buntzen dam were of wood

stave construction. The wood stave portions of these pipe lines have now been replaced with pipes of riveted steel.

Power House No. 2

Power House No. 2 is built on solid rock and is of reinforced concrete construction. The design of the building was carefully studied from an architectural point of view, and its massive proportions harmonize with the precipitous mountains which form the background.

On the main floor of the building which is 5 feet above high water level, three units of a total capacity of 40,500 h.p. are installed. Each unit consists of one Dick Kerr 8,900 kv.a., 3 phase, 60 cycle generator of the revolving field type, generating current at 2,200 volts, direct driven at a speed of 200 revolutions per minute by four Pelton Doble water wheels, the combined capacity of which is 13,500 h.p. The generator and four water wheels are all pressed on to a hollow nickel steel shaft 51 feet 3 inches long, forged in one piece. A separate pipe line is provided between the surge tank and the power house for supplying water to each unit. Close to the back of the wall of the power house this pipe line divides into four branches, each branch supplying water to one wheel of the unit; on each branch a Doble hydraulically operated gate valve is provided which controls the admission of water to the two nozzles which direct the water on to the buckets of each wheel.

The speed regulation of each unit is controlled by a Lombard Governor which opens and closes the main nozzle according to the load on the unit, through links attached to a rocker-shaft.

Each unit is also provided with two Pelton-Doble auxiliary relief water economising nozzles. Should the load on the unit fall off suddenly, these two relief nozzles are opened by the action of the governor as the main nozzles are closed, thereby avoiding any sudden change of velocity in the pipe line. The relief nozzles are closed slowly by means of springs, and hammer in the pipe lines is thus reduced to any desired extent and wastage of water is minimized.

For excitation purposes, three 300 kw., exciter units are provided, one of which is placed at the rear of each main unit. Each exciter is composed of a Dick Kerr induction motor-generator set direct driven by one Pelton-Doble water wheel, mounted on one end of the shaft.

The bus bars are placed in cells in the bus bar room at the level of the main floor, and the voltage is controlled by Tirrill regulators. The low tension generator and transformer switches, which are of the Canadian General Electric H-6 type, are placed in the low tension switchroom situated above the bus bar compartments. The transformer room is situated immediately above the low tension switchroom, and the equipment consists of four banks of three 3,000 kv.a., single phase, oil insulated, water-cooled transformers, by means of which the voltage is raised from 2,200 to 34,600 to be increased at an early date to 60,000 volts. The high tension switch room, which also contains the lightning arrester equipment, is situated above the generator room; the high tension switches are of the Canadian General Electric K-15 type. All of the low tension and high tension switches are electrically controlled from the operating bench board which is situated on the operating galley in the generator room.

All of the switches, switchboard equipment, and transformers were supplied by the Canadian General Electric Company.

Two 50 ton electrically operated travelling cranes control the entire length of the generator room, and one 25 ton electric crane is provided in the transformer room.

Stave Falls Plant

The Stave Falls plant as originally built consisted of a sluice dam 40 feet high provided with five sluice ways 22 feet wide, to take care of the flood discharge; a solid concrete intake dam; two 14 feet 6 inch steel penstocks later increased to four; a power house with four 8,825 kv.a. units and a trail-race channel 1,500 feet long excavated in the old bed of the river.

The sluice dam, which was partially built by the Stave Lake Power Company, consists of four concrete piers 8 feet wide, with two abutment piers, the spaces between the piers being filled with 24 inch stop-logs, 24 feet long, which can be removed by means of a specially designed electric winch, to permit of the passage of flood water.

The intake works consist of a solid concrete dam about 70 feet high at its lowest point, embedded in which are the four steel penstocks which are belled out to 19 feet diameter at their entrance and tapered down to 14 feet 6 inches in diameter where they leave the dam. The entrance to these penstocks is closed by steel radial gates, closing an opening approximately 20 feet square, and designed to operate under a maximum head of 45 feet. These gates are operated by electric winches set on the top of the dam. There are also two 42 inch exciter penstocks which are closed by radial gates.

In front of the radial gates are set screens of very large area. No special precautions are taken to protect the screens from ice, as it is a peculiar condition of the Stave River that no ice ever forms, even at times when zero weather obtains for as much as a week. The reason for the non-formation of ice is that there is a large underflow from the forests during the winter months, which raises the temperature of the water.

These dams raise the water 18 feet and are now being extended to raise the water an additional 22 feet. The sluice dam is being made into a solid dam

and the flood discharge will be taken care of by a new sluice dam being built at the Blind Slough.

The foundations of the power house were excavated in solid rock. The total quantity of rock excavation for the penstocks, power house and tailrace amounted to 75,000 cubic yards.

The tailrace canal is 70 feet wide, and designed to run 10 feet deep when all four units in the power house are in operation. In addition to the rock excavation for the tailrace, some 75,000 cubic yards of sand, clay and boulders were excavated by steam shovel.

Just below the power house a small V-shaped weir was built to hold the water to a proper height to seal the draft tubes. At present the flow of the river is rapid from below the foot of the tailrace, but when the lower plant is built, the water will be backed up to this weir.

The foundations for the power house are of solid concrete construction and the superstructure is a combined formation of steel and reinforced concrete. When the present addition is completed, housing the fourth unit which is now in operation, the plant will be 100 feet wide by 160 feet long. The turbine and generator room is 70 feet by 160 and a two storey lean-to 28 feet wide houses all the high tension and low tension switches. The control switchboard is on a gallery in a lean-to at the end of the building.

In the power house are installed at present two 10,000 kv.a. 3 phase, 60 cycle, 4,400 volt generators



Beauty and Power as exemplified by the buildings of the B.C.E.R. Co.—Upper left, transformer house, No. 1 Power house, Lake Buntzen; upper right, Point Grey sub-station; lower left, Earl's Road sub-station; lower right, Horne Payne receiving station; centre, No. 2 power house Lake Buntzen

built by the Canadian General Electric Company, driven by two 13,000 h.p. Francis type turbines built by the Escher Wyss Company of Zurich, Switzerland. Excitation is provided by two 250 kw. 125 volt generators, each driven by its own turbine, and each capable of exciting four machines. Governors and oil pumps were also provided by the Escher Wyss Company, the pumps being driven by individual wheels of the impulse type.

Six single-phase transformers of 3,000 kw. capacity each are located on the main floor, each in its own concrete vault with a steel hatch as a top. A



Jordan River Power House, Vancouver Island

travelling crane of 70 tons capacity spans the entire main floor, placing the transformers as well as the generators and wheels directly under the crane. The control switchboard is in a gallery at the east end of the building, giving the operator full view of every piece of moving machinery. All switches are solenoid operated, and, with the fuses, are located in reinforced concrete cells in a concrete lean-to parallel to the main building.

Jordan River Power House

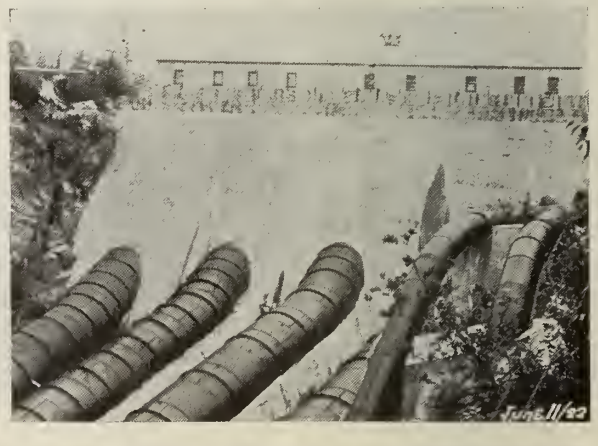
The original power house building completed in 1911 was a concrete structure 91 feet 6 inches long and 47 feet wide, in which two units of 4,000 kw. capacity were installed with the necessary exciters, low and high tension switches and transformers.

On account of the rapidly increasing load on the company's system, the original installation has been added to. The additions necessitated the extension of the power house building to accommodate a new 8,000 kw. unit with space for a fourth unit, and an entirely new high tension switchroom for the completed plant behind the power house. The extensions were completed in October, 1914.

The completed power house is a reinforced concrete building founded on concrete piles 12 inches in diameter, which penetrate to bedrock lying at a depth of 45 feet to 75 feet below the surface. The floor of the older portion of the building is 7 feet 6 inches above high tide level; the floor of the new portion is placed at an elevation 5 feet higher. The completed generator room is 211 feet 6 inches long and 47 feet wide in which are installed two identical 4,000 kv.a., units made up of Allis-Chalmers-Bullock 3 phase, 60 cycle, 2,200 volt generators driven direct at a speed of 600 revolutions per minute by a single Doble water wheel of 6,000 h.p. mounted on one end of the shaft, and overhanging the bearing at that end of the unit. The shaft is a nickel steel forging 14 inches in diameter and supported in two bearings 40 inches long.

No. 3 unit is made up of one 8,000 kv.a. Canadian General Electric 3 phase, 60 cycle, 2,200 volt generator, driven by two Pelton-Doble water wheels, one mounted on each end of the shaft and overhanging the bearings. The water wheels are rated at 13,000 h.p. The shaft is a hollow nickel steel forging 16 inches in diameter in the bearings, which are 60 in. long; these bearings are of the single shell type similar to those on No. 1 and No. 2 units.

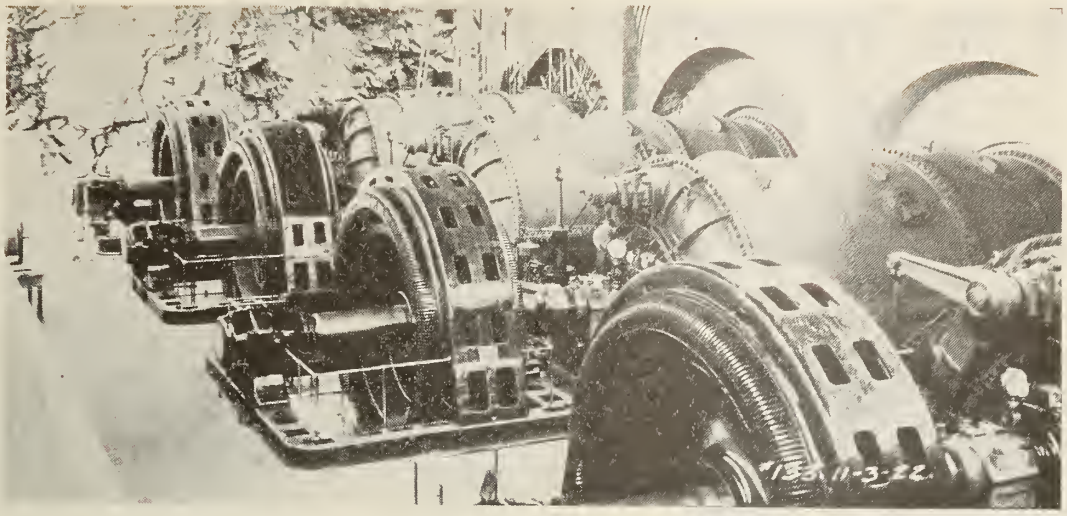
The two wheels of this unit are supplied with water through a flanged cast steel Y pipe which is bolted to the terminal end of the pressure pipe line immediately behind the unit foundation. The entrance connection of the Y is 44 inches in diameter and the branches are 34 inches. To these branches are bolted cast steel taper pipes, reducing to 24 inches, and to these are bolted 24 inch single disc steel body gate valves. These gate valves are operated by small reversible water wheels mounted on brackets on the yokes of the valves; the water motors operate a bronze nut on the rising stem of the valve through a sysetm of spur and bevel gearing. Water is supplied to the wheels through short pipes connected to the hood of the valves, and an automatic device is provided which prevents over-running. The cast-steel nozzle bodies



Showing four pipe lines at Stave Lake power plant

of the main and relief nozzles are bolted directly to the gate valves.

Each wheel is provided with an entirely separate, direct motion, oil operated, relay type Pelton-Doble governor; the piston of the governor motor cylinder is mounted directly on the extended needle stem of the main nozzle, and from this stem the auxiliary or relief nozzle is operated by double levers connected



Power plant interior of Stave Lake power installation

to the dashpot on the stem of the auxiliary needle. This direct application of the motive power of the governor to the needle stems of the water wheel, without any intermediate connections, is a great improvement over the old system of applying the power through a system of links, with their inherent lost motion and backlash. These governors have given exceptionally good regulation without causing any appreciable surges in the long pipe line.

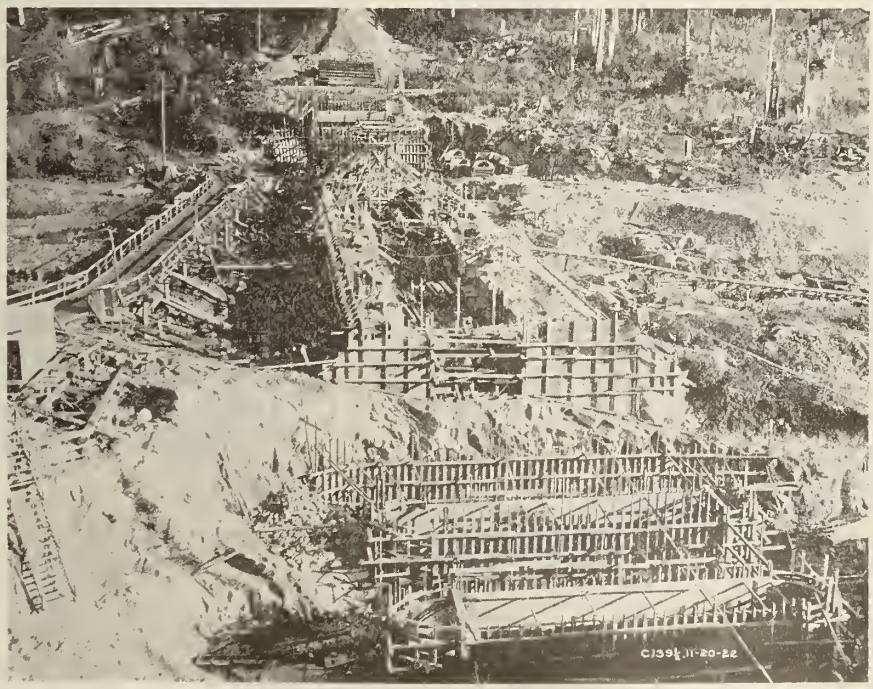
Oil pressure for the operation of the two governors is provided by a water motor driven gear type pump with a welded steel oil pressure accumulator tank. The pump motor is controlled by a float in a chamber connected with the accumulator tank. The governors may also be controlled by hand.

Three Exciter Units

Three exciter units are provided. Two of these consist of one 100 kw. 125 volt d.c. generator, with a 150 h.p. water wheel at the other end. The third exciter set consists of a 200 kw. 125 volt d.c. generator on the shaft of which are mounted a 300 h.p. induction motor and a 200 h.p. water wheel. Water is supplied to the exciter water wheels from a header connected to all three pipe lines, and an arrangement of valves permits any exciter unit to be run with water from any pipe line.

The transformer equipment consists of two banks of three single phase 1,450 kv.a. transformers, with one spare transformer, and one bank of three 3,000 kv.a. single phase transformers, stepping up the voltage from 2,200 to 60,000 volts.

These transformers are all of the oil insulated water cooled type and were supplied by the Canadian Westinghouse Company; they are placed in open compartments behind the units on the generator floor.



Construction work on Blind Slough Dam

3900 ft. Tunnel to Divert Flow of Lake and Develop More Power

Alouette Lake Water to be Utilized Along with That of Stave Lake—Present Plant Will be Enlarged and Two New Ones Erected—Extension to Dam is Under Way

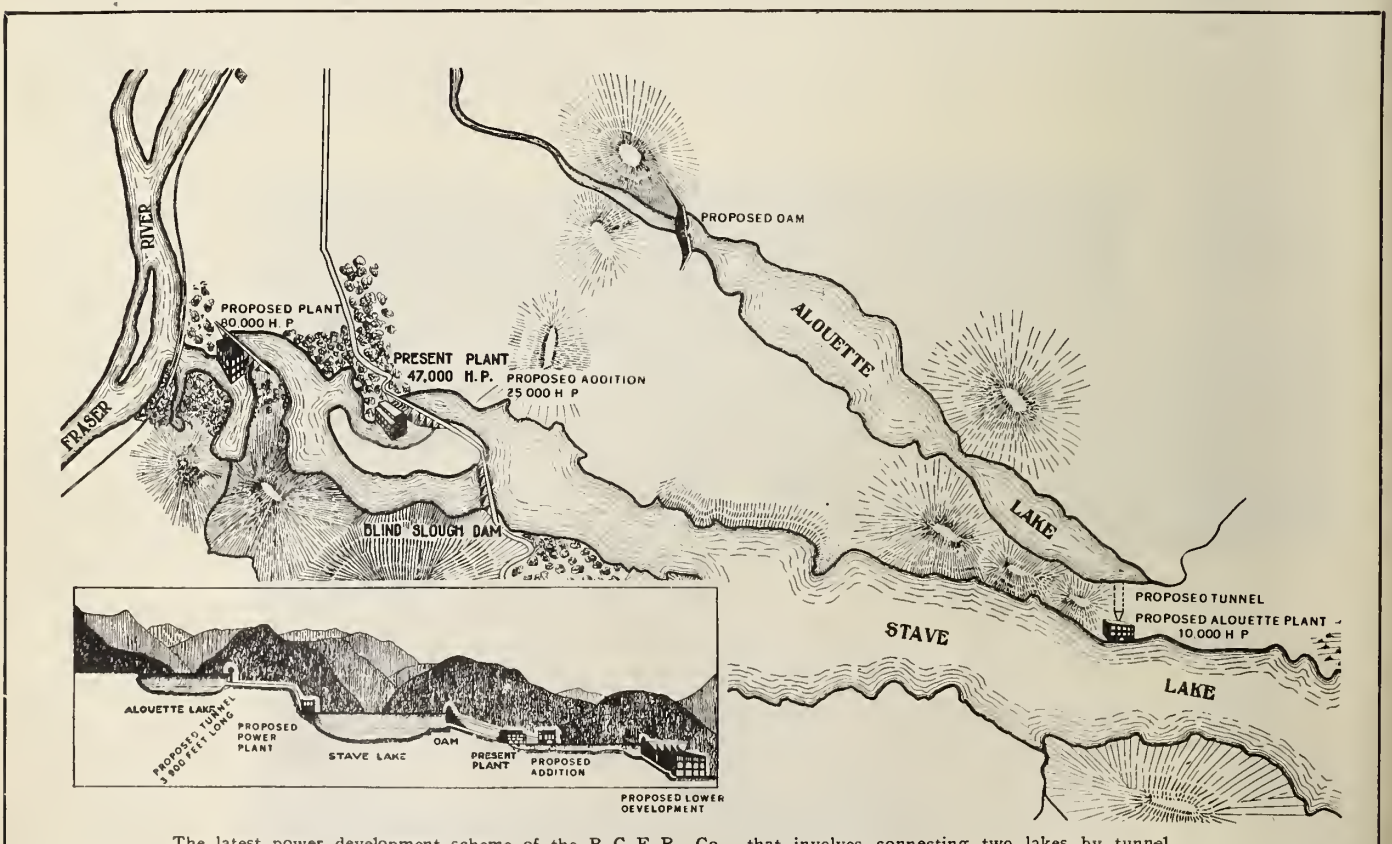
Plans are announced by the British Columb.a Electric Railway Company for a power development of 115,000 horse power on the Stave river. This will be developed in three plants, the construction of which will be extended over a period of five to ten years. It is anticipated that the expenditure will be in the neighborhood of $10,000,000. The present Stave Falls plant was built by the Western Power Company and taken over by the British Columbia Electric Railway Company after absorbing the former company in 1920. This plant has an installed capacity of 52,000 h.p., the fourth unit having been installed by the British Columbia Electric Railway Company in 1922, thus bringing the plant up to capacity.

During the last year work has been going on at a cost of $1,000,000, raising the present dam and building a new dam at the Blind Slough, which will increase the water storage fifty per cent.

Adjacent to Stave Lake lies Alouette Lake, distant about half a mile at its upper end. The water rights on Alouette Lake have been held by the Burrard Power Company, a subsidiary company to the British Columbia Electric Railway Company. It was originally intended to develop power by means of a dam and flume, but with the acquisition of the Stave River watershed, it is now proposed to tunnel between the two lakes, build a dam at the lower end of Alouette Lake and divert the water by means of Stave lake and river.

10,000 h.p. More

This diversion is at present the subject of an application before the provicial authorities and if permission is given, a power house will be built at the mouth of the tunnel on Stave Lake. This plant will use a head of approximately 140 feet and will generate 10,000 h.p. Although plans are not defi-



The latest power development scheme of the B.C.E.R. Co., that involves connecting two lakes by tunnel

nitely made, this plant will probably operate at a load factor of over 80 per cent.

The second installation under the proposed scheme is the addition of a fifth unit to the present Stave Falls plant, which will be made possible by the diversion of Alouette Lake water. By operating at a lower load factor than the Alouette Lake plant, 25,000 h.p. will be installed.

Three miles below the present Stave Falls plant, a third plant will be built known as the lower development. At this site it is estimated that a plant of 80,000 h.p. can be erected. The total flow from Stave Lake to tide water will be made use of in the present power house and in the lower development. The upper plant, now in operation, utilizes a 150 foot head and the lower plant will utilize the balance. Construction work on the Blind Slough dam is going on under the direction of R. S. Kelsch of Montreal, consulting engineer. E. E. Carpenter, formerly of the firm of Baker & Carpenter, San Francisco, has recently been appointed chief electrical engineer for the company and he will have immediate superintendence of the proposed new work.

Some B.C.E.R. Personals

GEORGE KIDD

Mr. George Kidd, president of the British Columbia Electrical Railway Company, is one of the leading figures among public utility executives in Canada. He came to British Columbia in 1909 as comp-



troller of the company from the the London offices of the B. C. Electric. In 1914, he was promoted to the position of general manager and has held the power of attorney from the board of directors to conduct the policy and financial affairs of the company in British Columbia. Mr. Kidd is president of the Electrical Service League of British Columbia and is a member of the honorary council of the Canadian Electric Railway Association.

W. G. MURRIN

William G. Murrin, vice-president of the British Columbia Electric Railway Company, Vancouver, B. C., has had a wide experience in electric railway operations both in British Columbia and in England. He came to Vancouver from London, England, in



1913 as mechanical superintendent, successively being promoted to superintendent of railway lines, assistant general manager and recently to the position of vice-president. Mr. Murrin is a past president of the Vancouver Canadian club and also of the Vancouver Automobile club. He is vice-president of the Electrical Service League of B. C.

JAMES LIGHTBODY

James Lightbody is publicity manager of the British Columbia Electric Railway Co., and honorary secretary of the Electrical Service League of British Columbia. He conceived the idea of bringing the four elements of the electrical industry together in Vancouver in 1920 and organized the British Columbia Electrical Co-operative association, afterwards changed to its present name. He was secretary of the Vancouver Electric club in 1921. Mr. Lightbody is also a member of the Rotary club of Vancouver, editor of the B. C. Electric Employees Magazine and "The Buzzer," the company's weekly publication to the public. The publicity department of the company handles all electric railway, light and pawer and gas advertising of the B. C. Electric Railway Company.

WILLIAM SAVILLE

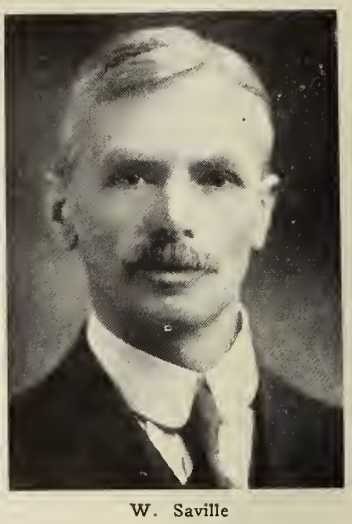
Mr. William Saville is general secretary of the British Columbia Electric Railway Company, Van-



James Lightbody



Percy Lewis



W. Saville

couver, B. C. Mr. Saville is a director of the Vancouver Electric club and a member of the Vancouver Rotary club.

PERCY LEWIS

Mr. Percy Lewis is purchasing agent of the British Columbia Electric Railway Company, whose department purchases $2,000,000 worth of supplies in a year.

The B.C.E.R. Company on Vancouver Island

By S. J. HALLS

While Victoria is generally looked upon as being a residential rather than an industrial city, it is interesting to note that the operations of the B. C. Electric take care of a commercial power load of 26,912 h.p. at the present time. Among the most important of the industries served are those of the B. C. Cement Co., 3,500 h.p.; Canadian Puget Sound Lumber and Timber Co., Ltd., 874 h.p.; Canadian Explosives, Ltd., James Island, 750 h.p.; Cameron Lumber Co., 500 h.p.; Yarrows, Ltd., 621 h.p.; P. Lyall & Sons Construction Co., Ltd., 1050 h.p.; Sidney Roofing and Paper Co., Ltd., 495 h.p.

The increase in power business during the past few years has been:—

Year.	H.P. Connected.
1919	22,325 h.p. connected.
1921	24,983 " "
1923	26,912 " "

The lighting and power operations of the company extend not only in Victoria but into the surrounding districts for some 25 miles out, including the municipalities of Saanich, Oak Bay, Esquimalt, and a number of other districts.

The total number of lighting consumers at the present time is 16,002, and this number is steadily increasing in the city and rural sections. Among the large lighting consumers on the company's lines are the Hudson's Bay Company, D. Spencer, Ltd., Parliament Bldgs., etc.

Victoria is noted as being an exceptionally clean, well lighted city, and has many miles of paved and boulevarded streets, with ornamental standards used for illumination purposes. The electrical stores to be found in Victoria are well located on its main streets and compare very favorably with the best to be found in the country. Electric ranges and all appliances are being pushed to advantage and several hundred homes now have all-electric kitchens and many installations are being put in every month.

There are at present two completely electrified apartment houses in Victoria. In general the outlook, electrically, is quite encouraging in all directions, and with a strong progressive central station in the field there is no fear but that the electrical needs of the city and the surrounding communities will be adequately cared for.



Electric storage battery locomotive hauling loaded cars to bottom of slope —Black Diamond Mine, Clover Bar

West Kootenay Power and Light Co. Have Wide Distribution

Several Subsidiaries Serve Many Towns— All Systems Operated by Parent Company

By L. A. CAMPBELL, Vice President and General Manager

The West Kootenay Power & Light Co. Ltd., is controlled by Consolidated Mining and Smelting Company of Canada, Ltd., and in turn controls the South Kootenay Water Power Company; Cascade Water, Power & Light Company; Rossland Water & Light Co. and Okanagan Water Power Co., all in Canada, and the Northpower Power & Light Co., operating in the State of Washington, U.S.A. The plants and distribution systems of the subsidiary companies are operated by the West Kootenay Power & Light Co.



L. A. Campbell

in charge of vice-president and general manager, Mr. L. A. Campbell.

The Lower Bonnington Falls Station is situated at Lower Bonnington Falls on Kootenay River, 10¾ miles downstream from Nelson, B.C. The plant was installed in 1897 with two 1184 h.p. units and one 1648 h.p. unit added in 1899 and operates under an average head of 37 feet. The turbines are 2 Victor, 39 inch, hor., double-runner, 180 r.p.m., 1184 h.p. each; 1 Victor, 45 inch, hor., double-runner, 180 r.p.m., 1684 h.p.; total 2016 h.p.; generators—2 Can. Gen. Elec., 3-phase, 60 cycle, 1100 v., 180 r.p.m., 750 kv.a. each; 1 C.G.E. 3-phase, 60 cycle, 1100 v., 180 r.p.m., 1500 kv.a.; total 3000 kv.a.; exciter turbines—3 Victor, 12 inch, 600 r.p.m., 35 h.p. each; total 105 h.p.; exciter generators—3 C.G.E., d.c., 125 v., 600 r.p.m., 30 kw. each; total 90 kw.; transformers—4 banks of 2 C.G.E. single-phase, air cooled, primary 1100 v., secondary 22,000 v., 1000 kv.a. each; total 8,000 kv.a.

Upper Bonnington Station

The Upper Bonnington Station is located at Upper Bonnington falls on Kootenay river, about 1 mile above Lower Bonnington Falls plant. The plant was installed in 1906 with two 8,000 h.p. units; two 9,000 h.p. units have been added, one in 1914 and one in 1916. Plant operates under an average head of 67½ feet. Turbines—2 I. P. Morris, 60 inch vert., Francis, 180 r.p.m., 8,000 h.p. each; 2 Allis-Chalmers, 65 inch vert., Francis, 180 r.p.m., 9,000 h.p. each; total 34,000 h.p.; generators—2 C.G.E., 3-phase, 60 cycle, 2200 v., 5625 kv.a. each; 2 C.G.E., 3-phase, 60 cycle, 2200 v., 7500 kv.a., each; total 26,250 kv.a.; exciter turbines—



West Kootenay P. & L. Co.—No. 2 plant, Upper Bonnington

2 I. P. Morris, 25½ inch, 400 r.p.m., 500 h.p. each; total 1000 h.p.; exciter generators—2 C.G.E., d.c., 125 v., 400 r.p.m., 150 kw. each; total 300 kw. Transformers—2 banks of 3 Can. West., single-phase, water-cooled, oil-insulated, primary 2200 v., secondary 60,000 v., 1875 kv.a. each; 2 banks of 3 Can. West., single-phase, water-cooled, oil-insulated, primary, 2200 v., secondary 60,000 v., 200 kv.a. each; 1 bank of 3 Can. West., single-phase, water-cooled, oil-insulated, primary 2200 v., secondary 22,000 v., 1,250 kv.a.; total 27,000 kv.a.

The Cascade Station is owned by the Cascade Water, Power & Light Co. Ltd., and controlled and

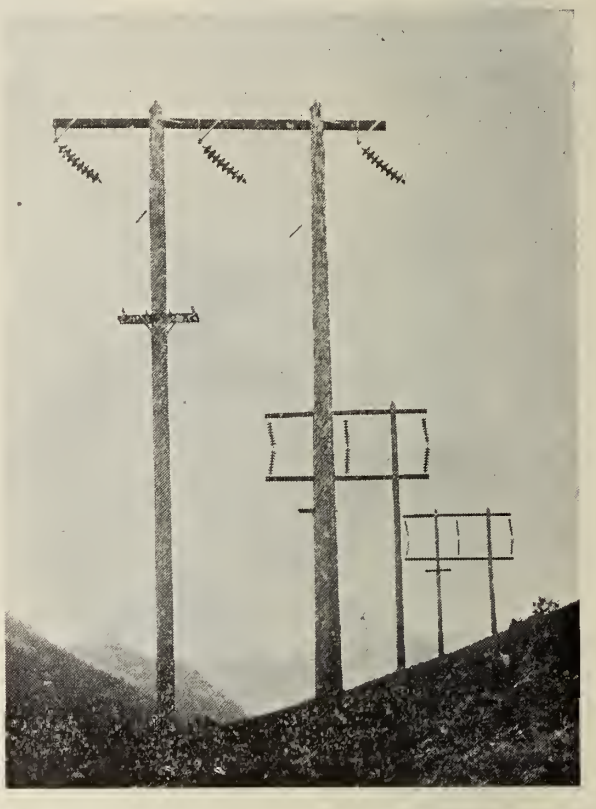
operated under lease by West Kootenay Power and Light Co. Ltd.; on Kettle river 12 miles below Grand Forks on C.P.R. Plant was installed in 1902 by Cascade Water, Power & Light Co. Ltd., which company has been controlled by the West Kootenay Power & Light Co. since 1907. Plant operates under an average head of 156 feet. Turbines—3 S. Morgan Smith, 39 inch hor., double-runner, 400 r.p.m., 1300



1500 kv.a. outdoor step-down station—West Kootenay L. & P. Co.

h.p. each; total 3900 h.p.; generators, 3 West., 3-phase, 60 cycle, 2200 v., 400 r.p.m., 750 kv.a. each; total 2250 kv.a.; exciter turbines—2 S. Morgan Smith, 12 inch, 110 r.p.m., 60 h.p. each; total 120 h.p.; exciter generators—2 West., 125 v., 1100 r.p.m. 45 kw. each; transformers—3 banks of 3 West., single-phase, self-cooled, oil-insulated, primary 2200 v., secondary 22,000 v., 390 kv.a. each; total 3510 kv.a.

Total length of transmission lines is 448 miles, of which 82 miles of double circuit line transmits power from the Bonnington Falls generating stations to Greenwood at 60,000 v., and 108 miles of single circuit (completed in 1920) transmits power to Allenby and Copper Mountain at 110,000 v., and 23 miles of single circuit transmits power from Greenwood-Allenby line to Penticton at 60,000 v. Allenby substation: transformers—1 bank of 3 Can. West., 3-phase, 60 cycle, primary 60,000 v., secondary 2,200 v., 1250 kv.a. each; total 2750 kv.a. Copper Mountain substation: transformers—1 bank of 3 Can. West., 3-phase, 60 cycle, primary 60,000 v., secondary 2200 v., 50 kv.a. each; total 1500 kv.a. Grand Forks substation: transformers—1 bank of 2 Can. West., 3-phase, 60 cycle, primary 60,000 v., secondary 440 v., 1250 kv.a. each; total 2750 kv.a. Greenwood substation: transformers—1 bank of 3 Can. West., 3-phase, 60 cycle, primary 60,000 v., secondary 2200



West Kootenay 110,000 v. line showing heavy curve with uplift



West Kootenay P. & L. Co.—Interior Upper Bonnington

v., 1250 kv.a. each; total 2750 kv.a. Penticton substation: transformers—1 bank of 3 Can. West., 3-phase, 60 cycle, primary 60,000 v., secondary 5,000 v., 500 kv.a. each; total 1500 kv.a. Rossland substation: transformers—1 bank of 3 Can. West., 3-phase, 60 cycle, primary 60,000 v., secondary, 2200 v., 1250 kv.a. each; 3 banks of 3 Can. Gen. Elec. 3-phase, 60 cycle primary 20,000 v., secondary 2200 v., 242 kv.a. each; total 5928 kv.a. Smelter substation, in Tadanac and owned by Consolidated Mining & Smelting Co. of Canada: transformers—2 banks of 3 Can. West., 3-phase, 60 cycle, primary 60,000 v., secondary 2200 v., 2500 kv.a. each; total 22,500 kv.a.

Distribution system (operated by company). Total length of pole lines, 18 miles of wooden pole lines in the municipalities of Bonnington, South Slocan, Trail Cascade, and Allenby; and 12 miles of

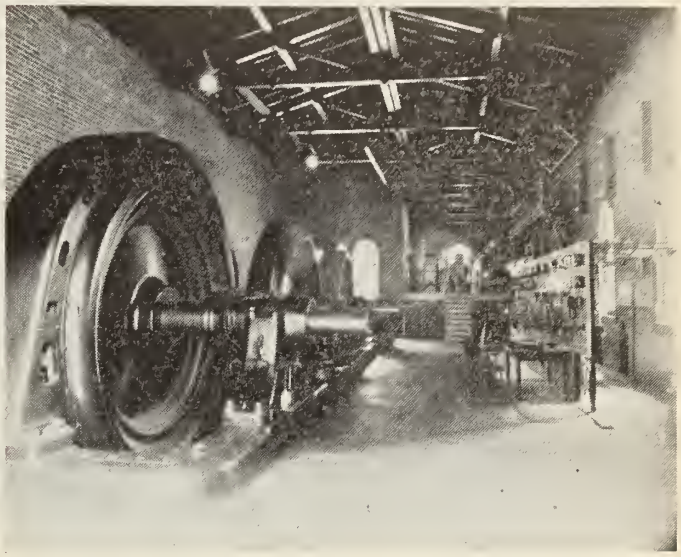
wooden pole lines in Rossland; primaries 2200 v., secondaries 110 v., 220 v., and 550 v.

Service

Power is distributed by the company in Bonnington, South Slocan, Trail, Rossland, Cascade, and Allenby and is sold in bulk to the municipality of Grand Forks for distribution in Grand Forks; to the municipality of Penticton for distribution in Penticton; to the municipality of Greenwood for distribution in Greenwood; to the Princeton Coal and Land Co. for distribution in Princeton, and to the Northport Power & Light Co. (subsidiary) for distribution in Northport, Washington, U.S.A.; number of customers, private, 1,188, commercial, 363. Total power generated during 1920, 164,040,200 kw. hrs., of which Upper Bonnington Falls Station generated 161,867,200 kw. with a maximum load of 23,800 kw. and Lower Bonnington Falls station (operated November and December only) generated 2,175,000 kw. hrs. with a maximum load of 2,700 kw.

Use of Power—Lighting 1%; mining 97%; sold in bulk for distribution 2%, continuous service. Power is delivered adjacent to C.P.R., Kettle Valley Rly., and Great Northern Rly.

Rates—Lighting, flat rate, 75 cents to 40 cents per 60-watt lamp per month net, with special charge for electrical appliances; meter rate, 10 cents to 4 cents per kw. hr., with minimum monthly charges of 25 cents to 10 cents per 60-watt lamp according to number of lamps used and subject to 10% discount. Power, 5 cents to 2 cents per kw. hr. with a minimum monthly charge of $1.00 connected h.p. and subject to 20% discount. Special rates for large blocks of power varying from 2 cents to 3/10 cents per kw. hr.



West Kootenay P & L Co. No. 1 plant, Lower Bonnington

Distribution in Courtenay by Municipal System

By C. S. WOOD, E. E.

The system owned and operated by the Corporation of the City of Courtenay, buys its power from the Canadian Collieries (D) Ltd., in bulk and distributes it to the city and surrounding district.

Twenty-five cycle, 3 phase current is supplied to the system by the Canadian Collieries at 2200 volts. The City of Courtenay has adopted a liberal policy with regard to its system, and power and light lines radiate in all directions from the incorporated area. The main extension supplies the headquarters of the Comox Logging & Railway Company with electric light and power at 3 phase, 220 volts to operate its machine shop, which is fully equipped for repairing all its logging equipment; an electric welding outfit has just recently been installed.

The Comox Logging & Railway Company supply the logs for the Canadian Western Lumber Co., which operates the largest mill on the Pacific Coast.

To supply the above logging company, it was necessary to build a line over ten miles long, and in order to reduce the line loss the current was stepped up to 4400 volts and then down to 220/110 at the terminus.

The line passes through the rich farming district, and every facility is given the farmers to obtain service along the line.

In another direction entirely, the village of Comox district, about 3 miles from the City of Courtenay is served with a single phase line, at 2200 volts, with secondary distribution transformers at many points along the line.

Within the City of Courtenay, power is supplied for a large variety of purposes, the largest single consumer being the Comox Creamery Association which has about 70 connected horsepower operating refrigerating and ice plant, ice cream and butter making machines, and a grain grinding and crushing plant. In addition to the above ice plant, two meat shops operate their own refrigerating plants.

The lighting rates charged are 14 cents per kw.h. less a discount of 20 % sliding to 7 cents for increased consumption; the power rates drop from 7 cents to 3-1/2 cents for all over 1000 kw.h. per month.

The gross annual revenue of the plant has increased from $5000.00 in 1918 to about $23,000.00 in 1923.

Penticton

One of the Gardens of the Pacific Coast



Buys its power from the West Kootenay P. & L. Co.

By F. L. McKEEVER, M.I.E.E.
Consulting and Municipal Electrical Engineer.

The Penticton distribution system will be of interest to Electrical News readers on account of the length of distribution line, compared with the small number of consumers. The greater part of 11 square miles included in the municipal acreage is given over to fruit orchards, mostly of 10 acres each, and the economical supply of electric energy to these scattered consumers had to be carefully worked out. The fact that about 99% of all the homes in the municipality enjoy the use of electric light and power at very reasonable rates, shows that the work of distribution is being actively prosecuted.

Up to January 7th, 1922, the municipality of Penticton generated its own electrical energy with Diesel engines. From that date all energy is being supplied in bulk by the Okanagan Water Power Co. Ltd., a subsidiary of the West Kootenay Power and Light Co. Ltd.

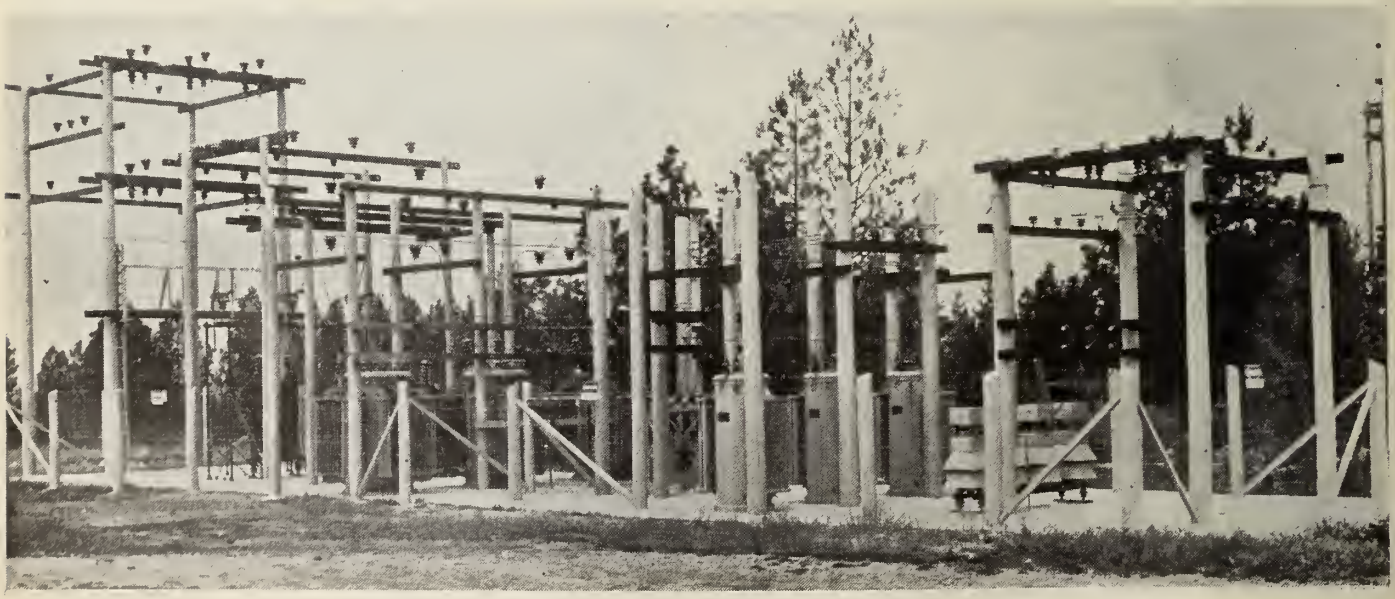
Power is sent from the latter's hydro electric plant at Bonnington Falls, a distance of 153 miles, at 60,000 volts, to Penticton, where all energy is transformed in an outdoor sub-station of 1500 kv.a. capacity to 4600 volts and delivered to the municipal switchboard.

The distribution is carried out by the municipality at 4,600 volts, 60 cycles, three and single phase. The area of the municipality being 7044 acres or 11.0 square-miles, the distribution of this large territory required pole lines of a total length of 42.68 miles, (not including the poles situated on private property). Length of pole line carrying secondary wires: 36.4 miles, 5.17 miles of three-phase and 15.21 miles of single-phase at 4,600 volts.

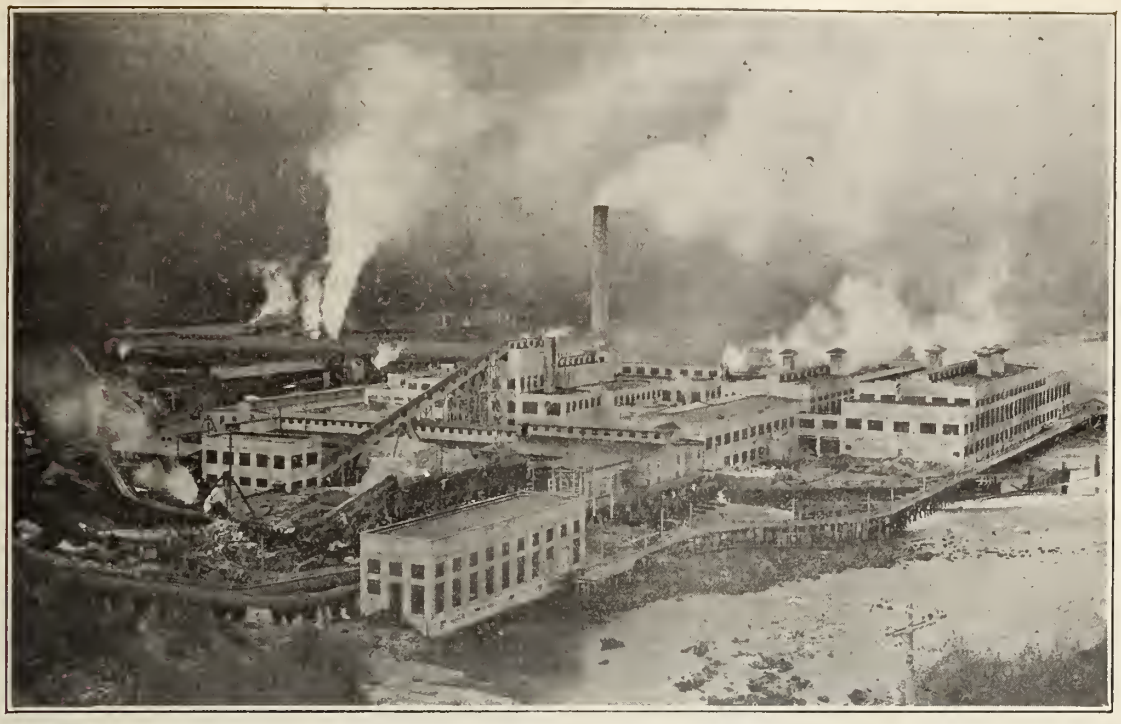
The roads within the municipality are lighted by 295 gas-filled lamps of 100 and 250 c.p. each, arranged in two series circuits of a total length of 24.6 miles.

The total number of services, light and power, is 1259, while the energy consumed by electric motors at the present time is not considerable. The number of electrical appliances installed in residences is fairly large and steadily rising. 31 electric ranges are in use and over 95% of the homes are using electric irons. Peakload is about 250 kw. and energy purchased in 1922 amounted to 646.000 kw. hours.

Light rate is 12 cents for the first 20 kw.h. per month, and anything over that is 8 cents; power rate (commercial) 5 cents for first 100 kw.h., anything above that amount 4 cents; domestic appilance rate: 3.5 cents per kw.h.; minimum rate for light service $1.25 per month; no meter rents.



Penticton out-door station receiving power from West Kootenay Power Light Co.



Plant of Pacific Mills Ltd., at Ocean Falls, B.C.

New Dam at Pacific Mills Plant Gives Large Power Increase

Improvements Made to Electric Station—Substitution of Electric Motors for Steam Drives Creates Demand for More Energy

By H. H. COOLIDGE, Electrical Superintendent

One of the more recent hydraulic and power installations has been made by Pacific Mills Limited at Ocean Falls, B. C., a town of about 1500 population, situated at the extreme end of Cousins Inlet, 307 miles north of Vancouver.

Previous to 1916 the Ocean Falls Company had constructed a plant for the manufacture of ground wood pulp to be shipped in hydraulically pressed bales. For grinding this wood into pulp, six turbines, manufactured by Jens Orten Boving Co., were installed. These were designed to develop 1600 h.p. at 123.65 ft. head and originally drove four three pocket grinders at 225 r.p.m. To furnish the electrical requirements, three Francis type turbines manufactured by J. A. Gordon Co., were installed. These were designed to develop 950 h.p. at 600 r.p.m. at the same had as above, and were direct connected to three 600 kw. generators.

In 1916 Pacific Mills Ltd., had taken over the old company and started the construction of a new mill, which was designed to produce not only ground wood, but also sulphite for use in the manufacture of news and wrapping, and sulphate in the production of "Kraft". Considerable extra power was therfore required, so it was neresary to build a new dam whidh would increase the head of water and at the same time give considerable storage capacity. The spillway elevation of the old dam was at elevation 215, which afforded practically no storage capacity, but served the purpose of a diversion dam, directing water to the 12 foot penstock which carried water in round about course to the power house, and grinder room below, at elevation 116.00. It was likewise necessary to install additional generators with a capacity of 7500 kv.a and turbines producing 9000 h.p.

A new dam, which has been recently rebuilt as will be described later, was a gravity type 644.1 feet in length and 53 reet maximum height. This was built on an 8 degree curve, constructed of plums and 1 2-4 mixture concrete with 10% hydrated lime which served the purpose of both increasing the density of the concrete and making it more easily handled and tamped. The foundations are on granite, and very little excavation was necessary previous to construction. Seams and cracks were present, but were not of a serious nature; and drains leading to the toe of the dam were laid along thee cracks so as to carry off any seepage that might exist. The spillway was

412 feet in length at elevation 245 and a bulkhead approaching each end was at elevation 251.00. The dam was capable of discharging 20,000 c.f.s. and additional flow could be handled through the five waste gates in case of emergency. These were five feet wide and three feet in height with centre elevation at 201.5. The gates were of wood, hand operated although provisions had been made to operate them by motor.

To head gates with 12 x 12 openings, operated by hand or motor, controlled the water flowing through two 12 foot diameter steel penstocks; No. 1 connecting with the old installation and No. 2 with the new power house. These penstocks are from half an inch to three eights inch in thickness and are 966 feet and 549 feet in length respectively. They are corried on reinforced concrete cradles. Two heavy concrete anchors which completely encircle the pipes, were constructed on the slope of the hill to prevent sliding. The maximum grade of the pipes is about twenty-one degrees; one expansion joint is placed in each pipe.

While consructing this new dam, water was conducted to the old power house in the 12 ft. penstock as installed by the old company. The upper portion of this pipe had several bends and turns which could be eliminated by cutting through a sand embankment. For this reason about 600 ft. of new pipe were ordered and run practically straight to the bottom of the hill so as to connect with the lower portion of the old penstock. While the two pipes were being connected, water was run through an 18" rivted steel pipe connected to one of the 950 h.p. turbines, which produced temporary requirements of light and power. As soon as No. 1 penstock was connected the steel previously used was taken down in about 12 foot lengths and used for No. 2 penstock.

A Heavy Rainfall

The water supply has a drainage area of about 150 square miles. This area is made up of Link Lake which is 15 miles long with an area of 9.18 square miles at elevation 250, and the additional area hemmed in by granite mountains rising about 4,000 feet over the lake. At the north end of the lake is a narrow valley through which runs the Braden River, which is the chief source of supply to the lake. The drainage area would be entirely too small for our requirements of 1600 c.f.s., if it were not for the fact that our annual rainfall is very heavy, averaging about 154 inches per year. This not only gives the supply of water required but also is a large factor in cutting down evaporation due to the high humidity of the air and the small amount of sunshine.

In the summertime the run off is very rapid, owing to the nature of the drainage area, one inch of rain raising the lake about 15 inches in 24 hours time. In the months from January to May the precipitation in the mountains is in the form of snow with the result that we rely almost entirely on the reservoir capacity. Previous to the recent raising of the dam this was about 122700 acre feet, and whenever there was a backward spring it became necessary to economize in the use of water as much as possible in order to keep the mill running through this period. This was done by using up the storage of ground wood which had been piled out in laps during the period of higher water which exists from June into the middle of January. Using ground wood laps permitted cutting down the water required by the grinders and in fact when the head dropped to about elevation 230 it was necessary to use from the storage pile in order to keep the mill supplied with sufficient ground wood, the head being too low to supply sufficient power to the grinders.

A New Turbo-Generator

The power requirements have been gradually increased owing to speeding up the paper machines over the original design for speed, which created greater power demand throughout the plant, and also due to the substitution of electric motors for steam drivers, wherever it was practical to make a change. This greater demand of power has made it necessary to install an additional 6,300 h.p. turbine which will be directly connected to a 5250 kv.a. generator, operating at 400 r.p.m.

The annual low water period and the additional power requirements both present and future, made it advisable to increase the height of the dam for the second time. After carefully checking the strength of the penstocks, turbine wheels, etc., it was decided that 15 feet was the greatest increase advisable. The weakest points in the penstocks, the branch openings to the water wheel, have been reinforced by constructing reinforced concrete rings around both main pipe and branches for the distance required. The raising of the dam is practically complete. In raising it, a few changes in profile and arrangement have been made. The profile remains about the same excepting that it has been widened sufficiently to take care of the additional head of water to be retained. The bulkhead sections have been lengthened and raised to elevation 270 as against 251 previously, and the spillway elevation is now at 260 as against elevation 245 previously. This difference of ten feet existing between spillway and bulkhead as against 6 feet difference before, is to allow the discharge of the water to be taken care of on 365 feet of spillway instead of 412 feet as above.

The waste gates have been eliminated entirely, as it was decided that they would be of no practical value.

In the head gate section, the old head gates are being used again. The stands were allowed to remain in place until the bulkhead was raised above them, and were then placed in their new position, the only additional requirements being four stems 19 feet each in length. The 18 inch sluice or by-pass

gates were considered insufficiently strong for the additional head and were replaced with new gates by a diver. New stems and stands were required with these. The head gates, by-pass gates and stands were all furnished by the Coffin Valve Co.

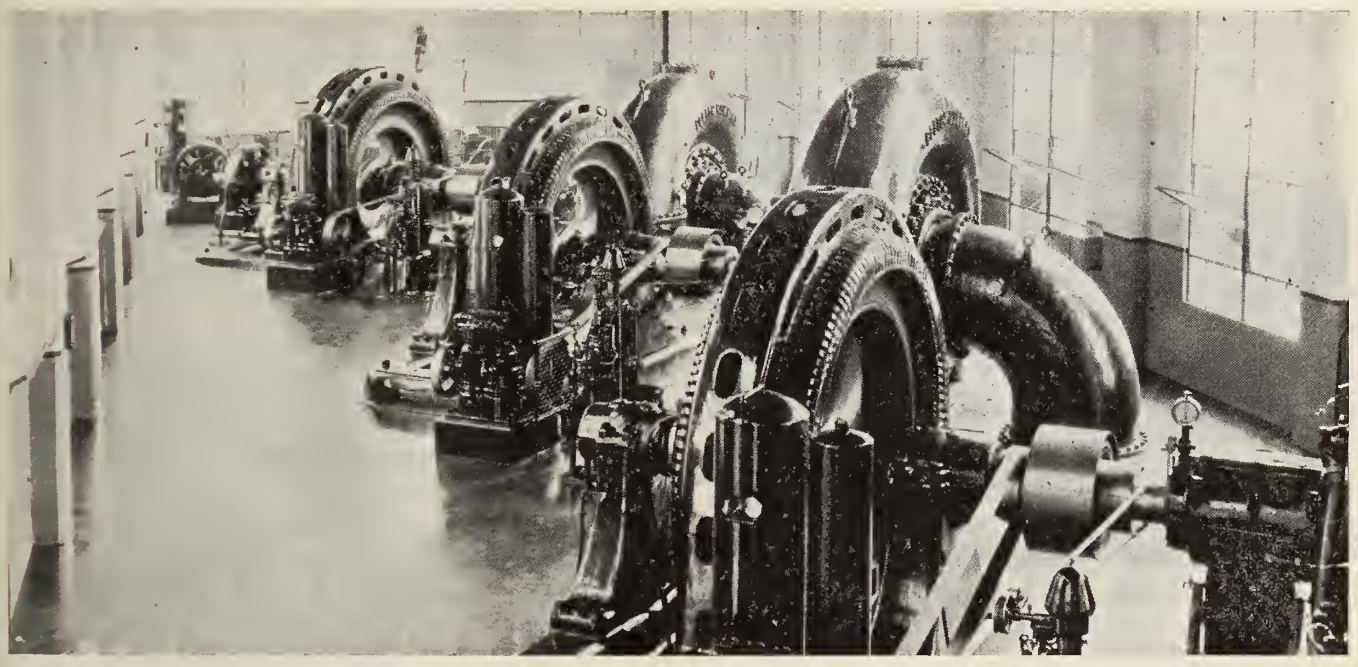
In pouring the dam while binding the new concrete to the old, extreme care was used to provide against water pressure that might exist between the two pours. The surface of the old dam was carefully chipped. A cut off trench was cut along the top of the old dam and a series of horizontal trenches, leading to vertical trenches draining to the toe of the dam, were cut in the face in which were laid porous tile 3 in. and 6 in. in diameter, covered with 1-4 mix of cement and coarse sand so as to allow water to pass through into the tile. To strengthen the bond, holes were drilled at about 4 ft. 6 in. centres and deformed bars grouted in; the exposed ends of these project about five feet into the new concrete.

A 1-3-5 mixture of concrete has been used and about 14000 cu. yd. of concrete poured as against 20,000 cu. yd. in the older structure. Some plums have been used but owing to the necessity of speeding up the work during the last two months, and the difficulty in procuring and handling these, the percentage is very small.

The new height of dam will increase the storage from 122700 acre feet to about 211500 acre feet and wil give a continuous increase of about 3000 h.p. The small increase in storage is due to the precipitous nature of the mountains surrounding the reservoir, which do not allow much flooding of additional land.

The power house remains as originally constructed, provision having been made for the addition of the new wheel. The building is 41 feet wide and 151 feet in length, constructed of concrete, as in the case of the balance of the other buildings. This houses the original installation of two 2100 h.p. horizontal Pelton Francis type water wheels running at 225 r.p.m. direct connected to 1875 kv.a. Canadian General Electric Co., generators and one 4500 h.p., 360 r.p.m. turbine direct connected to a 3750 kv.a. generator, both the same manufacture as above. The generators are 2200 volts, 60 cycles, 3 phase. Excitation of the large generator is through a direct connected exciter and the others through motor generator sets. Added to the above will be the new turbine of 6300 h.p. and 5250 kv.a. generator operating at 400 r.p.m., which is now being installed. These turbines are controlled by Woodward governors.

The switchboard equipment is of black slate comprising four machine panels; three exciter panels; one regulator panel; one panel containing one graphic watt-meter; two recording watt-meters and one K 16 Tirrill Voltage Regulator; two panels for controlling motors for driving exciters which comprise controls to oil switches and compensators; these compensators are located in the bus chamber; and six feeder panels for controlling feeders. Switchboard is Canadian General Electric throughout with exception of the Canadian Westinghouse graphic watt-meter.



Interior view of power house, Ocean Falls

The bus structure and oil switches are enclosed in a concrete chamber, the oil switches being mechanically remote controlled from the operating gallery above.

Three tanks, located outside of the building, contain governor, transil, and bearing oil, the governor and bearing oil being piped directly to the governors and bearings, the transil oil being piped to the bus

chamber. All oil is filtered through a blotting paper filter, and the piping is so arranged that oil may be pumped through the filter direct from tanks or from bearings in either direction, or the filter may be eliminated entirely. The filter is a standard Canadian General Electric oil filter.

Both power houses are equipped with travelling cranes, the new power house being operated with a 440 volt 10 h.p., C. G. E. motor with lifting capacity of 20 tons.

The new power house delivering 2200 volts and the old power house delivering 440 volts are tied together with the tie lines and transformers. The old power house is used for reserve only. The feeders are as follows: to the sawmill 500000 c.m. 2200 volts; to the acid plant 2/0 copper, 440 v.; to No. 1 substation two feeders of No. 0, 2200 v.; to the 174 in. paper machine 2 feeders of No. 4/0, 2200 volts and to the 122 in. machine two feeders of No. 2/0, 2200 volts; to Townsite No. 0 copper. All feeders leave the



View of Dam looking south, June 17, 1923

new power house with 500,000 c.m. cable leading to a tower from thence the feeders are as above.

Feeders Underground

All feeders leave the power house underground, and the 174" machine, 122" machine, and No. 1 substation feeders are underground throughout, using fibre duct and lead covered cable. From the tower outside the Townsite feeder is overhead; the sawmill and acid plant feeders are overhead throughout. Interior lighting is all conduit using nitrogen filled lamps.

The majority of motors are squirrel cage induction motors; there are several wound rotor motors equipped with brush lifting device, and also a number of d.c. motors on cranes, monorails, etc., these being located in the roll grinder room where the rolls of the paper machines are ground. The squirrel cage motors drive pumps, agitators, etc., and the wound rotor motors drive rewinders, heaters, barkers, etc. Two of the machines, the 122" and 174", are driven by variable speed motors direct connected on the line shaft. These motors are driven by direct current obtained from two motor generator sets.

The motor generator set in connection with the 122" machine is a Canadian Westinghouse synchronous motor, 375 h.p. output, 310 kv.a. input, 2200 v. 60 cycles, 3 phase, 900 r.p.m. The generator is a Canadian Westinghouse d.c. generator 250 kw. 500 v, 900 r.p.m. with exciter direct connected. The d.c. motor is a Canadian Westinghouse, 300 h.p. 500 v., 486 a., 50 to 350 r.p.m.

The motor-generator set in connection with the 174" machine is a synchronous motor, 725 h.p. output, 567 kv.a input, 2200 v, 60 cycle, 3 phase, 149 a, 720 r.p.m. The d.c. generator is Canadian Westinghouse 500 kw. 500 v, 1000 a, 720 r.p.m., with exciter direct-connected. The d.c. motor is 600 h.p., 500 v, 960 a, 50 to 350 r.p.m. Canadian Westinghouse.

The synchronous motors of both sets have oil switches and auto-starters and panel containing motor ammeter, field ammeter, power factor motor recording watt meters, together with field rheostate and field switches. The d.c. motor and generator has a Westinghouse panel board containing the necessary relays and switches. Provision has been made for starting, stopping and changing speeds at a convenient place in the paper machine room proper, the sets being located on the floor below.

For driving the paper machines speed regulation is very essential as any change in speed will vary the weight or thickness of the paper and is apt to cause a break which is a very serious interruption in the output of paper.

Ocean Falls is Typical of British Columbia Industry

By F. W. MacNEILL,
Sales Engineer, C.G.E. Co. Ltd., Vancouver, B.C.

The paper mill at Ocean Falls is one of British Columbia's premier industries. Many are the exclamations of wonder from tourists on the boats that call there, at the establishment of such a mammoth industry. The location received its name from the wonderful falls which were formed by the falling over a cliff of the waters of the lake fed from snow-topped mountains. These falls were so close to the sea shore as to be a wonderful spectacle in themselves. However, the spectacle has to a large extent been removed through the construction of a dam across the outlet so that it is only at times of high run-off that water now flows over the crest. This will be still more the case when work now in progress is completed. This work consists in raising the crest of the dam to increase the hydraulic head and storage capacity, and will be completed by the time this issue goes to press.

Part of the hydraulic power is used directly in waterwheels for driving pulp grinders; practically all the balance is used for generating electricity, which in turn is used for driving the motors for all the mill purposes. Two of the paper machines themselves, however, are driven by steam engines. In the present state of application of power in the paper industry, the use of a steam engine or in fact any single prime mover for a whole machine, is being superseded by the use of separate prime movers for the various sections of one paper machine, all running together in a definite relation to one another. Now that greater water storage is being accomplished, and greater generator capacity available as a result, it is possible that the method of driving one or both of these two machines may be changed.

There are four paper machines in all, three being used for producing news-print, and the other for kraft and wrapping papers. The capacity of the mill is about 225 tons of newsprint and 30 tons of wrapping paper per day of 24 hours. This mill has been known to run 363 pays per year, shutting down only for July first and Christmas Day. There is no difficulty in disposing of the product which is shipped to many parts of the world.

The townsite of Ocean Falls is beautifully kept. All the houses are owned by the company, which also operates the general store. Owing to the rocky nature of the ground, the streets are planked. The total population is probably 2,500, and the rainfall is considerable, but nobody objects, as the rain and snow are the prime requisites for power. Three passenger steamship lines serve the port, the Grand Trunk Pacific, three times a week; the Canadian Pacific once a week; and the Union Steamship Company twice a week. These boats all carry freight also and deep sea vessels call for freight for export as well.

One of the views shows the mill, while still partly under construction; the others show typical electrical installations. This industry is a forceful example of the application of electricity to a basic manufacturing process, which sends "Made in B. C." products to the world.

Fernie Has Self Supporting System

By ARTHUR J. MOFFAT

From 1909 to May, 1922, the electrical energy of Fernie was supplied by a municipal steam plant situated just outside the city limits. Energy is now purchased at a lower rate from the East Kootenay Power Company's plant at Bull River, about sixteen miles from Fernie in a direct line.

This company's Bull River Plant consists of about two miles of wood stave pipe delivering water to a power house at a head of 275 feet. There are two turbines of 3,600 h.p. each and 2 generators of 2,500 kv.a. each. The electrical energy is delivered to Fernie by a thirty-six mile transmission line of stranded aluminium wire at 66,000 volt, 3 phase, 60 cycle which also supplies other points. The East Kootenay Power Co. are at present engaged in construction work at Elko on a 15,000 h.p. plant which will utilize water from the Elk River at 190 feet heat. A twelve foot tunnel is at present being driven through rock in connection with the scheme.

The municipality receives the energy at the old Power House at 2,300 volts and supplies to the citizens at 220 or 110 v. as required. Fernie and the immediate vicinity has a population of 5,000, and the city supplies about 885 consumers, including domestic and power.

The present rates are: domestic lighting, cooking, etc., 10c. per kw.h. up to 20 kw.h. in summer and up to 30 kw.h. in winter; any quantity used over 20 kw.h. or 30 kw.h., as the case may be, is supplied at 4c. per kw.h.; commercial use, 7c. per kw.h.; meter rentals: domestic, 15c. per month; commercial, 25c. per month. The above rates are less 10% discount for prompt payment.

The number of power users is 30, and units up to practically any amount can be arranged for. The total output for 1922 was 411,110 kw.h. as against 381,000 kw.h. for 1921. The department has always been on a self-supporting basis, and made a net profit during 1922 of $2,161.00 after taking care of sinking fund requirements, interest on debentures, and depreciation reserve fund, as well as an extension of the distribution system to take in 100 consumers. The bonded debt is $74,000.00 The change over from 2 phase to 3 phase cost $4,225.00, including switch board panel, transformers, and wiring changes, and the reserve fund now stands at $12,190.00 which is available for renovations. The city has a street lighting system of 100 nitro-filled lamps in series, as well as a similar circuit of 12 large nitro lamps, the latter replacing 12 arc lamps. No extensions are under contemplation at present as practically the whole of the settled area is now included in the distribution system. Increased consumption is due principally to domestic uses being increased and partly to more power being used.

The Canada Gazette announces the incorporation of Henry Engineering Co. Limited, capitalization $50,000, to manufacture and generally deal in storage batteries, etc. Head office, Toronto.

Large Electric Installation Operates Comox Coal Mines

Water Conveyed from Diversion Dam Through Rock Canal, Suspended Wooden Flume and Ditch to Wood Stave Pipe Line Leading to Power House —All Mine Equipment Electrically Operated

The Comox group of mines on Vancouver Island have an electric installation, by means of which everything about the mines needing power to operate is supplied with electric current. This installation forms one of the largest and most modern of all the plants used in connection with coal mining anywhere on the continent.

The plant is situated on the Puntledge river about one mile from Comox Lake, where a diversion dam was built. From this point the water was conveyed about two miles by means of a rock canal, a suspended wooden flume and a ditch. By a reinforced concrete intake, with a capacity of 1200 second feet, the water was brought to a pipe line and penstocks with sand trap, Taintor gate and spillway. The pipe system comprises about one mile of wood stave pipe, 8 feet in diameter, ending in a concrete Y-branch from which provision for two 6-foot wood stave pipes with 6-foot valves has ben made. From this point one 6-foot wood stave pipe is installed approximately one mile long, ending in a concrete Y branch from which two 4 ft. 6 in. wood stave pipes, with valves at Y branch, take it to a straight pipe thence to a lock joint steel pipe. Pitot tubes are installed in the penstocks at the power house to measure the water, which has a static head of 350 feet from the intake to the power house with a working head of 270 feet.

The power house is a reinforced concrete building containing two 6,000 h.p. Escher-Wyss, Francis type, turbines, 500 r.p.m., directly connected to a C.G.E. generator and exciter, 400 kw. at 13200 volts, 25 cycle, 3 phase. There are no transformers in the station except a 100 kw. stepdown for station use, the power being transmitted at the voltage as generated. The switchboard is placed in an annex, in a gallery overlooking the generator sets; generators and lines are protected with remote control switches enclosed in concrete cells. The power house is one of the simplest in construction. It is completely fireproof and the use of combustible material of any kind is avoided. The cables are all carried in ducts, which are buried in concrete floors and walls.



Main impounding dam—Can. Collieries Ltd.



Generating plant of Canadian Collieries Ltd.—a most attractive exterior

Four 3-phase transmission circuits leave the power house, consisting of 2/0 stranded cable; two circuits each on two separate pole lines. The transmission system is connected in a complete ring, connecting each sub-station on the ring, so that any section can be isolated without interrupting the supply, making in all about forty miles of transmission line.

Sub-stations are located at Nos. 4, 5, 7, 8 Mines and at Union Bay. No. 8 sub-station is the largest and contains two 3-phase, 1,000 kw. transformers, 13200 to 2200 volts and one 500 kw., 13,200 to 400

volts; transformers are O.I.W.C.; the whole is mounted on a wheeled base on tracks for quickly pulling out from sub-station in case of emergency. Sub-stations 4 and 7 are next in size containing one 1500 kw. 3-phase transformer, 13200 to 2200 volts, and one 250 kw., 13200 to 440 volts. No. 5 sub-station contains one 1000 kw., 13200 to 2200 volts, and one 250 kw., 13200 to 440 volt transformer; all transforming equipment is duplicated in each sub-station except as to size. Lines are brought into each sub-station by special entrances to oil switches mounted in reinforced concrete cells. All H.T. lines are protected in concrete cubicles. Each sub-station has receiving switchboards for the 2200 volt and the 440 volt services and in every case, where possible, has been designed so as to have in the same building, hoisting and other equipment required by the mine in order to reduce operating costs. All safety devices which can make equipment "fool-proof" are utilized.

At No. 8 mine there are two Siemens electric hoists with Robeys mechanical equipment; the larger has a capacity of 1500 h.p. directly connected to double conical drums with clutches operated on the Ward Leonard control system which includes the



Motor driving hoisting equipment—Canadian Collieries, Dunsmuir, Ltd.

motor-generator sets; the smaller hoists having a 750 h.p. motor with single drum hoist and clutch.

All screening plants are operated by 440 volt motors up to 50 h.p. which are operated at 2200 volts; all equipment underground is operated by the 2200 or 440 volt services; locomotives are 250 volt d.c. operated by motor-generator sets in sub-station. No. 7 mine has a 750 h.p. motor operated hoist 2200 volt, 3-phase, 25 cycle. This is operated from a platform by means of a liquid rheostat developed by the Westinghouse Company. These have proven very successful. In the same building is a 500 h.p. synchronous motor at 500 r.p.m., belt connected to air compressor, which is put in for power-factor correction. The motor has a 50% full load starting torque, started up as an induction motor by transformers and paralleled to line in usual way.

The sub-station at Union Bay is on the end of a 13 mile transmission line and is the only one not connected in the ring. It contains one 500 kw. 13200 volt to 2200 volt, and one 250 kw. 13200 to 440 volt

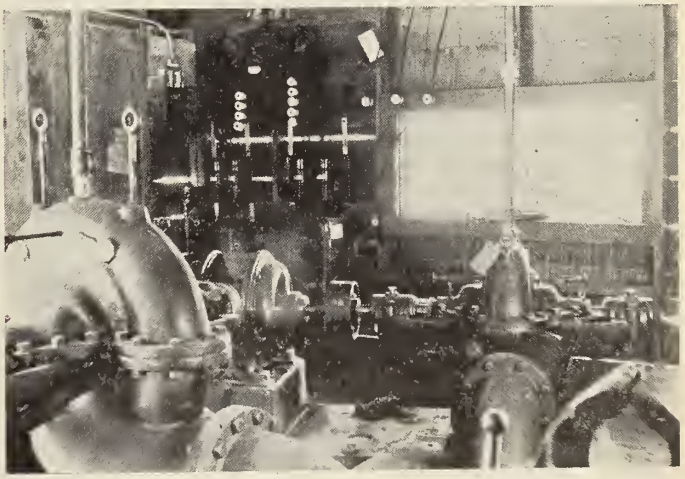


Pipe and power lines—Can. Collieries Ltd.

transformer. Lines from this sub-station feed coal washers, coal loading plant at the wharves and provide power and light for the district.

The ventilating systems at the mines are especially worthy of note as the most important thing here is freedom from interruption; therefore these motors are equipped with full automatic liquid rheostats for starting and start themselves when power is on whether the operator is present or not. A great deal of equipment in addition to the foregoing, including coal cutters, pumps, fans, etc., etc., is in use at these mines and all are electrically operated.

A. J. Ballard, Diamond State Fibre Company, has been confined, through illness, to his home for the past two months. He is progressing favorably.



Vinsulla irrigation pump house

Revelstoke Has Modern Water Power Plant While Vernon Employs Diesels

The Revelstoke Water, Light & Power Co. installed the original hydro-electric unit in 1899, being a single-phase, 125 cycle, 125 kv.a. generator. The city purchased the plant and installed a second unit, same as original; also gas engine with a 150 kv.a. belt-driven generator, all of which has been dismantled. Plant operates under an average head of 62 ft. Water is conveyed from intake dam to power-house through a 6 ft. wood-stave pipe about 1,100 ft. long. Turbines—1 Jenckes, 38 inch hor., single-runner, Francis, 450 r.p.m. 900 h.p.; 1 Escher-Wyss,



Dam, gatehouse and flumes, Revelstoke—C.P.R. main line in foreground

34 inch hor., double-runner, Francis, 360 r.p.m., 1400 h.p.; total 2300 h.p. Generators—1 Can. West., 3-phase, 60 cycle, 2200 v., 450 r.p.m., 450 kv.a.; 1 Can. West., 3-phase, 60 cycle, 2300 v., 360 r.p.m., 450 kv.a.; 1 Can. West., 3-phase, 60 cycle, 2300 v., 360 r.p.m., 750 kv.a.; total 1,200 kv.a.; exciter generators—1 Can. West., 450 r.p.m., 12 kw.; 1 Can. West., 350 r.p.m., 20 kw.; total 32 kw.

Transmission System—1½ miles of wooden pole line transmits power from power-house to Revelstoke, at 2,300 v.

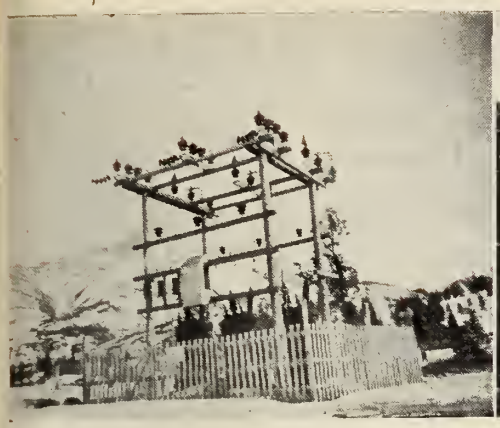
Distribution System—8½ miles of wooden pole lines, primaries, 2200 v., secondaries 110 v. and 220 v. All power is distributed in Revelstoke and vicinity; number of customers, private 600, commercial 50. The total power generated during 1921 was 1,435,195 kw. hrs., maximum 5-minute peak load 420 kw., average operating load factor 39%.

Use of Power—Lighting 60%; general power purposes 40%, continuous service. Power is delivered adjacent to C. P. Rly. Rates—Lighting, 10 cents to 4 cents per kw. hr. with service charge of 75 cents per month. Power, 10 cents to ½ cent per kw. hr., according to consumption guaranteed and voltage of power, with minimum monthly charge of $2.50. Water heaters, 750 watt, $2.00 monthly, each additional 250 watt at 50 cents. Discount on all rates 10%.

Vernon Has Had Splendid Success With Diesel Engines

The Electrical News has had frequent articles from the pen of Mr. S. H. Excell, superintendent of City of Vernon, B.C., where he is operating a Diesel plant most efficiently. Mr. Excell writes that the only news of further general interest is: "that the proposed lighting service to the Coldstream municipality is about to be commenced. This service will be stepped up to 4,400 volts for transmission; system is 3-phase 60 cycle, 2200 volts. Distribution will be effected from 4400/110 volt single-phase transformers. We are looking into the question of applying the one meter system for services using light, appliances, ranges and water heaters, believing it will be an advantage from both capital and maintenance points of view. In connection with the exhaust silencer jacket heater on our 525 h.p. Diesel engine, we find there is so much hot water available from its use, that ways and means are being considered to make use of this hot water in a small public bath house, during the time the water is not required for heating the power house. I am sending an interior view of the plant showing the two 200 h.p. units. It is full of detail. These units have run in parallel since early Spring and the variation in fuel consumption of the two units amounts to only about 1 per cent. in a month's running.

The electric lighting system of Summerside, P.E.I., is under the control of the town council. They have just secured the services of C. A. Anderson, a qualified electrical engineer, holding certificates from Dalhousie College, N.S., and the Nova Scotia Technical School.



600 kw. customers' sub-station—East Kootenay Power Co.



Aberfeldie plant—dam, pipeline and pondage



Aberfeldie dam at flood

Elko Station Adds 15000 H.P. to East Kootenay Power Co.

Mining Concerns Take Large Portion of Output — Elko Plant Soon Ready

By A. B. SANBORN, General Manager

The East Kootenay Power, Ltd. was incorporated under the Laws of the Dominion of Canada in April, 1922, to take over the undertaking and plant of the British Columbia & Alberta Power Company, Ltd., incorporated under the laws of the Province of British Columbia. The plant at that time consisted of a hydro-electric generating station on the Bull River —since named "Aberfeldie," (completed); 105 miles of cedar pole transmission line (completed); and water rights on the Elk River near Elko, B. C.

Service was commenced on May 7th, 1922. On July 15th, a 20 mile line extension was authorized into Kimberley, B. C., which was completed on October 1st, and on November 1st work was actively commenced on the development of the Elk River at Elko, B. C. This work is being rapidly pushed to completion, and it is expected to have this in operation by November 1st, 1923.

The "Aberfeldie Plant

Aberfeldie is situated on the Bull River seven miles north of Bull River town. This plant consists of two 3,600 horse power, 600 r.p.m., vertical turbines operating under 275 foot head, governed by two oil-pressure governors, and direct connected to two 2,500 kv.a. vertical generators, 3 phase, 60 cycle, 2,300 volts, with direct connected exciters. The transformers are star-delta, 2,300/66,000, oil insulated, water cooled. There is 448 feet of 6 ft. boiler plate steel penstock, at the top of which there is a 32 x 45 ft. surge tank. From the surge tank to the dam, the water is conducted through wood stave pipeline 8,400 feet long and 7 feet in diameter. The dam is reinforced concrete with 140 feet spillway and two Taintor gates, the dimensions of which are 9 x 20 feet. The Taintor gates are electrically operated and are used for flood control.

The Elko Plant

The Elko Plant, under construction, is situated on the Elk River, 1/2 mile from the town of Elko, B. C. The plant consists of two 7,500 horse power vertical turbines operating under 190 feet head, governed by two oil-pressure governors, direct connected to two 6,000 kv.a. generators, 3 phase, 60 cycle, 6,600 volts, with direct connected exciters. In addition to this, there is a 125 horse power, 100 kilowatt motor-generator for excitation. The switchboard is remote control and all high-tension switches are remote control, battery operated. Duplicate lines to the plant with high-tension oil circuit breakers in each line and high-tension bus tie, with high-tension oil circuit breakers connecting both lines. There are two separate transformer banks each consisting of three 3,000 kv.a. oil-insulated, water cooled transformers 6,600/66,000 volts, delta-delta.

The territory served by this company extends from Kimberley, B. C. east as far as the Alberta Boundary, and in Alberta as far as Hillcrest. The customers include the cities of Kimberley, Cranbrook, Elko, Bull River, Fernie, Blairmore, Coleman, Hillcrest and Bellevue, and the great Sullivan Mine, (together with a new concentrator which will be completed by the Consolidatd Mining and Smelting Company) the Coal Mines of the Crow's Nest Pass Coal Company, Ltd., the Coal Mines of the International Coal & Coke Company, Ltd., McGillivray Creek Coal & Coke Company, Ltd., West Canadian Collieries, Limited, and Hillcrest Collieries, Ltd.

Electric Power in the Lumber Industry

Never Before Have There Been so Many Changes From Steam to Electric Drive— Entire Electrification of New Lumber and Shingle Mills

By J. MUNRO, Power Plant Agent, B.C.E.R. Co.

We consider the present issue an opportune and timely occasion to briefly record the present stage in the rapidly increasing use of central station light and power in the lumber mills of British Columbia. Lumbermen, it may be said with no disrespect to them, are somewhat conservative and ultra cautious and many have been reluctant to acknowledge and utilize the manifold advantages and superiority of the electric drive.

While formerly all mills, large and small, used the old-fashioned steam engine drive, now only small mills, either unable to finance the up-to-date equipment or outside the reach of a reliable light and power company, follow the old and wasteful practice. Indeed it can now be safely asserted that any mill within the distribution area of an electric system which neglects to utilize the services wholly or partly, is placing itself at a disadvantage compared with its rivals in this now highly specialized industry.

Formerly it was thought that because a mill had the advantage of waste wood to use as fuel for the steam boilers any alternative source of motive power was not worth considering. Today it is fully recognized by the really efficient lumber mill designer or executive that the matter of cost of fuel for a private steam plant is only a minor phase of the problem of how to operate a modern lumber mill most economically, efficiently and successfully.

Utilizing the By-product

The ideal lumber mill of the future is one designed to burn up the smallest possible amount of the so-called waste material and to utilize the maximum quantity of the same to produce by-products convertible into a saleable and commercially valuable form.

Some present day mills are designed so that—(1) Saw dust is separated from shavings and graded into bins, the saw dust is sold for use in drying and sweeping floors, while the shavings in excess of those sold are fired in a boiler for air heating and kiln drying purposes; and (2) Edgings and rough ends are taken from the machines and sorted into sizes to be later made into such articles as crate sticks, surveyors' stakes, florists' or gardeners' sticks for plants, etc., and the balance sold as fire kindling wood.

It is on record that mills have been known to have an income from saw dust and shavings more than twice the cost of their light and power bills on central station service.

Electrical equipment has played a large part in speeding up production and cutting down maintenance and operating costs. The analytical study given to the necessary power applications has developed a number of special motor drive schemes not previously used and which have all tended towards elimination of waste motion and power and the consequent saving of repairs and upkeep costs.

Never before has the lumber industry in and around the larger cities of British Columbia seen so many changes from steam to electric drive and the electrification of entirely new saw and shingle mills.

In and around the cities of Vancouver and New Westminster alone we find the B.C. Electric Railway Company Light and Power Dept. serving the undernoted larger mills of the district. Indeed the light and power department of this company claim that in some measure they serve every mill within the boundaries of their territory.

200 Motors in one Mill

One of the largest electrically equipped saw mills in the world is located at Fraser Mills, New Westminster, belonging to the Canadian Western Lumber Co. There are over 200 motors, up to 250 h.p., in size in this mill. Individual drive is used except where fluctuating load conditions on several machines of a kind make grouping advisable to maintain a steady load on the motor. The connected motor load is as follows:—

Saw mill	918½	
Two planing mills	1,461½	
Finishing shed	395	
Shingle mill	480½	
Sash & door factory	315½	
Veneer plant	153½	
Yard and isolated machinery	571	
Lighting	467	4,762½ h.p.

A typical example of a first class moderate sized mill is that belonging to Robertson & Hackett Saw Mills Ltd. which shows the following details:

This mill along with other large mills like the Rat Portage Lumber Co's Mill and the False Creek Lumber Co. take their energy for illumination from the central station company thus saving capital expenditure equal to the value of a private generator and the capitalized value of its depreciation, repairs and maintenance, besides practically eliminating the risk of being in darkness through generator trouble or breakdown.

Standard Mill With an Average Output of 120,000 ft. B. M. Per Day

Saw Mill			
Log haul and head saw		250 H.P.	steam engine
Edger and trimmers			
Burner Conveyor	40 H.P.		
Bandsaw 8" x 54"	75		
Small Edger	25		
Machine Shop	10		
Filing room	5		
set works on travelling log carriage	7½	162½ H.P.	
Lath Mill—output 25,000 per day		75 H.P.	
Planing Mill			
No. 24 S. A. Woods planer			
6" Band saw			
No. 107 S. A. Woods Sticker	125 H.P.		
Berlin Rip Saw			
Fan	50		
No. 94 Berlin Planer	50		
Planer & Fan	50		
Conveyors 2 x 10 H.P.	20		
Grinding room	5		
Trim saws 3 x 5 H.P.	15		
Air Compressor	3		
Portable Grinder	1	319 H.P.	
Sash & Door Factory—			
Capacity output say 100 doors per day.			
Planers, stickers, mortisers, double end tenoners	40		
Blower, 2 sanders, cramp	50		
Buzz planer, band saw, circular saw	10		
Planer	25		
Fan	20		
Window framer machine	5		
Rip saw	5		
Belt sander, jig saw sander	3		
Grinder	1		
Pump	1		
Cut off saw.	5		
Door making machinery, —7½—3 and 3	13½	178½	
Yard Derrick—20 h.p. & 7½ h.p., 500 d.c.		27½	
		Gross total	762½ H.P.

One of the finest and latest built shingle mills on the Pacific Coast is that of the Hunting Merritt Lumber Co., Marpole, Vancouver. This mill is entirely electrically operated, each of the seventeen shingle machines having a 20 h.p. or 3 h.p. motor attached.

Space does not permit us giving a detailed statement of all the advantages of electricity in the lumber industry but we hope the foregoing brief sketch will convince the reader that the lumber and electrical industries in British Columbia are united in the closest bond of co-operative effort to improve the efficiency and success of what is British Columbia's premier industry.

How Some Lumber Mills Use Electric Power

Mill	Connected Motor Load	Operating
Brunette Lumber Co., New Westminster	1,340 H.P.	Saw, planing lath and shingle mills.
Hammond Cedar Co., Hammond	1,037½ H.P.	Saw, planing and shingle mills.
Campbell River Lbr. Co., White Rock	965 H.P.	Saw and planing mills.
Westminster Shook Co., New Westminster	828 H.P.	Box factory.
Pacific Box Ltd., Vancouver	815½ H.P.	Log haul and head saw, box factory.
Robertson & Hackett, Vancouver 762½—	556½ H.P. —	Saw, planing and lath mills.
	178½ H.P. —	Sash and door factory.
	27½ H.P. —	Yard and shipping derrick.
King Farris Lbr. Co., Kings Stn. Surrey	600 H.P.	Saw and planing mills
Cedar Cove Operations, (Heaps Mill) Vancouver	515 H.P.	Planing and shingle mills.
McNair Lumber Co. Ltd., N. Vancouver	479½ H.P.	Saw and planing mills.
Restmore Mfg. Co., Vancouver	448½ H.P.	Furniture factory.
Laminated Materials Ltd., New Westminster	439 H.P.	Lumber products.
Seaport Shingle Mills, Ltd., N. Vancouver	403 H.P.	Shingle mill.
B. C. Mills Timber Co., Hastings Mill, Vancouver	400 H.P.	Planing mill, hogger and multiple saw.
Fraser Valley Hemlock, S. Vancouver	402½ H.P.	Saw and planing mill.
Walsh Lumber Co., Ltd., N. Vancouver	345 H.P.	Saw and planing mill.
B. C. Fir & Cedar Lumber Co., Vancouver	365 H.P.	
Arbuthnots Sash & Door Co., Vancouver	304½ H.P.	Saw, sash and door plant.
John Hanbury & Co.	300 H.P.	Planing mill.
Ladner Lumber Co.	219 H.P.	Saw and planing mill.
Webber Lumber Co., Pt. Haney	215 H.P.	Saw and planing mill.
Stewart Co., S. Vancouver	200 H.P.	Saw and planing mill.
Eburne Saw Mills Ltd., Marpole	200 H.P.	Planing mill.
L. H. Collins, Dominion Lumber Co., Surrey	190 H.P.	Saw and planing mill.
B. C. Box Co., Marpole	170 H.P.	Log haul, head saw and box plant.
Robt. McNair Shingle Co., Pt. Moody	157½ H.P.	Log haul and head saw.
H. M. Ellis Ltd. Whonnock	145 H.P.	Saw and planing mill.
B. C. Box Co. Ltd., Vancouver	130 H.P.	Box factory.
Dixon & Murray, Vancouver	110 H.P.	General wood working, show case makers.
McLeods Sash & Door Co., Vancouver	108 H.P.	Sash and door plant.
Hobson Shingle Co., N. Vancouver	100 H.P.	Shingle mill.
Bailey Lumber Co., N. Vancouver	100 H.P.	Shingle mill.
Hunting Merritt Lumber Co.	100 H.P.	3 machine shingle mill with fan & conveyor.



The City of Vancouver as it will look on Convention night July 27. Make your plans so that you will be one of those to answer "present"

Electrical Contractors and Dealers of the Canadian West

Will Meet in Convention in Vancouver on July 27th—Every Electrical Man from Winnipeg West is Cordially Invited and Urged to be in Attendance

Electrical contractors and dealers in the Western Canadian division of the Association of Electragists, International, will gather in Vancouver for their first divisional convention on July 27th, 1923.

Arrangements for the convention are in charge of C. C. Carter, Executive Committeeman for the Western Canadian Division, and P. F. Letts, Convention Secretary, assisted by James Lightbody of the B.C.E.R. Co., and Rey E. Chatfield of the Electrical Service League of British Columbia.

James R. Strong, president, and Laurence W. Davis, Director of Promotion and Development of the Association of Electragists, International, will represent the parent organization, and O. C. Small, the Society for Electrical Development.

The convention will open with a closed session consisting of the executive committee of the local association of Electragists, the Advisory Council of the Electrical Service League of British Columbia and the representatives of the International Association and the Society for Electrical Development in the Rose Du Barry Room, Hotel Vancouver, at 10 o'clock in the morning.

The program for the convention proper follows—

12. (Noon.)—Luncheon with the Electric Club of Vancouver, Oval Room, Hotel Vancouver.

Open Forum.

2 P.M. to 5.30 P.M.—Afternoon session, (President Strong in the Chair).

Addresses:

Laurence W. Davis, "Estimating and Selling the Electrical Job."

O. C. Small, "Overcoming Sales Resistance against Electrical Appliance Sales."

F. T. Groome, "Illumination and Control of Light."

6.30 P.M.—Dinner—Hotel Vancouver. George Kidd, President of the Electrical Service League of B. C. presiding.

Address—Jas. R. Strong.

Great Work of Electrical Service League of British Columbia

A History of Its Accomplishments With Brief Mention of the Men who Have Stood Behind it

By REY E. CHATFIELD, Secretary Manager

During the summer of 1920 a number of leaders in the electrical industry were called together in Vancouver by Mr. George Kidd, general manager of the British Columbia Electric Railway Company, for the purpose of forming some organization for the promotion of the electrical industry in British Columbia. It was felt that more active work should be done by means of proper machinery backed up by sufficient funds to promote the welfare of the electrical industry.

In order to accomplish this it was necessary to build an administrative organization and accordingly the British Columbia Co-Operative Association was formed. This was merely a loose organization of all branches of the industry; membership in the association was open to anyone in the industry who cared to support the association financially.

A constitution and by-laws were drawn and the following officers were elected shortly after the first meeting:

President, George Kidd, general manager B. C. Electric Ry. Co.; vice-presidents—W. G. Murrin, asst. general manager B. C. Electric Railway Company; William McNeill, asst. general manager Western Power Company; Advisory Council—E. E. Walker, sales engineer B. C. Electric Ry. Co., (Chairman); E. Brettell, electrical dealer, Electric Supply & Contracting Co.,—(Vice-Chairman); H. Pim, local manager Canadian General Electric Co., (Honorary Treasurer); Jas. Lightbody, Publicity Manager B. C. Electric Railway Co., (Honorary Secretary); John R. Read, local manager Canadian Westinghouse Company; J. F. Little, local manager Northern Electric Co.; George Horsman, E. B. Horsman & Son, jobbers; W. W. Fraser, electrical contractor; S. E. Jarvis, electrical dealer and contractor.

The Advisory Council is elected for a term of one year and functions as a Board of Directors. At first the various activities undertaken were supervised by volunteers from the industry.

In November 1920 an Electric Show was held in Vancouver under the auspices of the Co-operative Association. Some eleven thousand persons visited the show, which attracted widespread attention. During the remainder of that fiscal year the association, through its merchandising committee, drew up merchandising schedules which were tied in with the advertising in the local papers. In July 1921, the association engaged Rey E. Chatfield of San Francisco as secretary-manager in order that the work might be more actively followed up by a man whose entire time and energy could be devoted to the work.

Survey of Local Conditions

A survey of local conditions was immediately made by the fieldman and upon his report it was decided the first work should be done among the contractor-dealers. Education of the individual in the industry is useless unless, through some organization,



Rey E. Chatfield

the individual can put into use the methods he has learned. The Contractor-Dealers Association held open meetings for a time to which all contractor dealers in the city were invited and methods of accounting, figuring costs and overhead were discussed. As a result of this activity some thirty-five accounting systems have been installed for contractors and dealers by the fieldman.

The effort of the Vancouver Association of Electrical Contractors and Dealers to include in its membership all the small residence wiremen failed and to facilitate the education of this class of contractor the B. C. Electrical Contractors Association was formed, the members of which organization were entirely residence wiremen.

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Some of the Finest Stores on the Continent



Main Vancouver showroom of B.C.E.R. Co.



Rankin & Cherrill's modern electric store, Vancouver

Are Found in Canada's Pacific Coast Cities



Interior Cope & Sons' electric store, Vancouver



Corner of Victoria sales rooms of B.C.E.R. Co.

To facilitate the spreading of information on costs, accounting, merchandising and selling, a monthly bulletin has been issued to the trade containing specific information on methods of determining costs, etc. This little bulletin has received very favorable notice both in Canada and the United States.

Electrical Service League of B. C.

During this year the name of the Association was changed from "The British Columbia Electrical Co-operative Association" to "The Electrical Service League of British Columbia."

In an attempt to combat the "cut price evil" a little pamphlet entitled "The Cost of the Lowest Bid" was issued by the League and mailed to every person taking out a building permit and, periodically, to all the architects in the province. Later a blue print of standard wiring symbols was furnished every architect, together with wiring regulations and instructions for determining the proper number of circuits, etc., to comply with wiring regulations.

Previous to Christmas of 1921, the League was successful in obtaining the co-operation of the electrical interests in the city in a co-operative advertising campaign which took the form of display cards, newspaper advertising, window streamers and window decoration.

An Electrical Home Exhibit was held in conjunction with the Building and House Furnishing Show in Vancouver. Three completely equipped and furnished rooms were built as a cross section of a bungalow and served to demonstrate the "convenience outlet" idea. Some 80,000 persons viewed this exhibit.

The First Electric Home

In October the League exhibited its first Electrical Home, which was built by a firm of plastering contractors and loaned to the League. The cost of advertising and operating the home was in the neighborhood of $2500, of which $1500 was furnished by building material firms in return for advertising, and the balance by members of the industry. The entire industry, central station and wholesale executives down to curbstone wiring contractors, united to make the operation of the home a success. The home was open to the public for a period of two weeks and was viewed by twenty-two thousand people.

Another co-operative advertising campaign promoting the sale of appliances as Christmas gifts was conducted by the League during the month of December with greater success than the campaign of the previous year.

Adequate Store and Window Lighting

Store window and store lighting occupied the attention of the League for the first three months of the year 1923 with great success. The idea of adequate lighting is so firmly sold in the minds of the merchants of Vancouver today that new installations are conforming more and more to standard illumination practice.

This illumination campaign was followed up by a campaign for better church lighting and a campaign for better industrial lighting in co-operation with the local Workmens' Compensation Board.

Following the first lighting campaign the dealers co-operating with the central station held a "Free Repair Week" during which time all portable heating appliances were repaired—labor free. Approximately 1000 heating devices were again put in use as a result of this campaign.

Electric Toaster Campaign

The League has just completed an electric toaster campaign in conjunction with a local bakery firm that greatly increased the sale of toasters over the normal volume of business.

The two contractor dealer organizations have amalgamated and the curbstone evil is almost non-existent at this time.

During the last year through the efforts of the League 1,995 1/2 inches or 27, 937 lines of free space has been obtained in local publications presenting the electrical idea to the public. At the same time the League paid for 1,112 inches or 15,568 lines of advertising in the daily papers in connection with the various campaigns which have been conducted for the benefit of the industry. Electrical and other technical magazines have devoted 667 1/2 inches or 9,345 lines of space to the League activities which has given the local co-operative work much valuable publicity.

Since the League was organized election of officers have been held each year and today the officers are:—

President—George Kidd, general manager B. C. Electric Co.; vice-president, W. G. Murrin, asst. general manager B. C. Electric Railway Company; secretary-manager, Rey E. Chatfield; Advisory Council—E. E. Walker, sales engineer B. C. Electric Ry. Co., (Chairman); S. E. Jarvis, electrical dealer & contractor, (Vice-Chairman); H. Pim, local manager, Canadian General Electric Co., (Honorary-Treasurer); Jas. Lightbody, publicity manager B. C. Electric Ry. Co., (Honorary-Secretary); John R. Read, local manager Canadian Westinghouse Co.; J. F. Little, local manager Northern Electric Co.; George Horsman, E. B. Horsman & Son, Jobbers; P. F. Letts, electrical dealer & contractor; R. A. Graham, electrical dealer & contractor.

League work in Vancouver has produced results that will be lasting. Through the League and the Electric Club the men in the various branches of the industry meet to discuss common problems. This has brought to the industry in Vancouver a most valuable asset which will remain when League work may be forgotten, viz., a common understanding.

British Columbia Sets the Pace in Wireless Progress

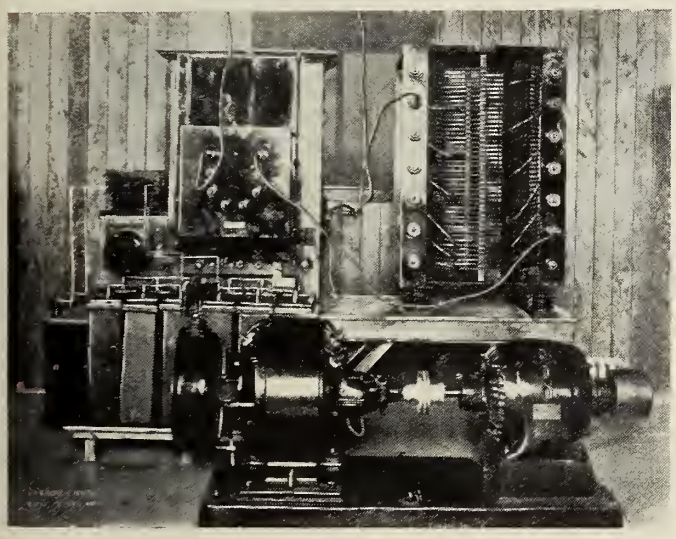
Radio Widely Used for Commercial Purposes —A Multitude of Amateur Receiving Sets— Mines, Timber Firms, Pulp and Paper Companies, Fisheries, etc., Operate Own Stations

By E. W. KELK

Not many years have passed since Marconi first gave to the world his method of wireless communication; but rarely has such rapid development been seen.

Primarily intended as an aid to shipping in distress and as a means of communication between vessels at sea and the land, it has far exceeded original expectations and may now be classified as a valuable commercial asset; indeed, it might be said with all truth that the world today is steeped in radio. Distances at one time considered beyond the bounds of possibility are now spanned with very little effort, and as a medium of long distance communication it compares very favourably indeed with the cable.

Broadcasting has become immensely popular and



5 kw. transmitting set, Marconi type

has a multitudinous following. In consequence a general knowledge of the underlying principles of electricity and magnetism has been disseminated among the masses, which has tended to extend a much broader understanding of these potent factors in our daily life; and this is precisely as it should be, for in the home, no less than in industry, the benefits of electricity are manifold, and where it is used so should it be understood. It is not the purpose in this article, however, to give a dissertation on wireless in general, but to tell briefly what an asset it has proven to the proud and prosperous province of B. C.

Pioneers invariably have a rough road to travel, and the pioneers of radio in British Columbia were no exception to the rule. At the outset, some twelve or thirteen years ago, the Pacific coast group of commercial radio stations consisted of three stations situated at Vancouver, Victoria and Pachena Point, the latter an isolated spot at the entrance to the Juan de Fuca Straits on the west coast of Vancouver Island. The 1.5 kilowatt sets of Schumacher type then installed were possessed of many shortcomings and were hopelessly inadequate for the task in hand; and it was only by obtaining the assistance of the U.S. installation at Cape Flattery, which acted as relay, that messages received from vessels at sea could be transmitted from Pachena Point to Victoria, a distance of approximately 80 miles. Old-time operators of the service are wont to ruminate on the difficulties of establishing communication in those days, for frequently a week or more would pass and not a dot or dash would be heard. Happily this state of affairs was not of long duration.

Present System of Seven Stations

With the necessity arising, more efficient apparatus was installed and the system gradually extended until it now comprises seven stations, which covers the Pacific seaboard from Vancouver to Prince Rupert, and forms what is officially designated as the British Columbia Branch of the Canadian Government Radiotelegraphs.

During the past two years the system has been thoroughly reorganized and all apparatus brought fully up to date, so that at the present time all the latest developments are to be found embodied in the service.

For transmission 5 kilowatt sets of Marconi pattern are in almost general use; but at certain stations this is exceeded; for instance, at Estevan Point 25 kilowatts are available for use if necessary and the apparatus is of naval construction and design, which, incidentally, makes this station one of the most powerful and efficient on the Pacific coast.

At Vancouver and Prince Rupert 2 kilowatt Poulsen Arc sets have been installed in addition to the

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Winner of First Prize—uptown Showroom Window of Montreal Light, Heat & Power Cons.

Prize Winning Windows In June Bride Contest

After Painstaking Consideration, the Judges Have Awarded First to a Montreal Window—Second Prize Goes to Saskatoon, While Montreal and Calgary Divide Third Class Honors

It is not an easy matter to decide between the respective merits of a number of window displays, even when the actual windows are before the judges. It is a much more difficult matter when only the photographs are available—not only because it is possible, by skilful handling, to make a good photograph of a poor window, but the work of different photographers on the same window will vary considerably. The awards have been made in this case after taking all these items into consideration and eliminating inequalities and unfair comparisons as much as is humanly possible.

The judges who were good enough to act were two men specially fitted for the positions by wide experience. Fred Booth is a member of the firm of Pringle & Booth, who specialize in window photography; he is also a past president of the Ontario Society of Photographers. Mr. C. B. Morden, the other judge, is in charge of window dressing for Murray-Kay Co., Toronto, and is treasurer of the Toronto Display Men's Club. The Editor also sat in on the deliberations.

We reproduce the winning photographs herewith and take the opportunity of thanking not only the prize winners, but also the large number of merchants who unsuccessfully took part in the contest. There were some very fine examples of window dressing and one can well imagine that the results obtained would be considered as sufficient justification for the efforts put forth. If one may form a conclusion from the photos submitted, there is a very much larger percentage, than formerly, of our electrical merchants, who are paying particular attention to their windows and they are evidently becoming rapidly expert in the art of window dressing.

2nd PRIZE

The window of The Electric Shop, Saskatoon, won second prize. The proprietor is Mr. D. F. Streb, and the display is the handiwork of Mr. Clem Dick.





3rd PRIZE

The Sayer Electric, Monreal boasts an expert window trimmer in the person of Harold E. Sayer. He wins third prize along with Wilkinson's of Calgary.

3rd PRIZE

J. R. Wilkinson, of the Wilkinson Electric Co. Ltd., Calgary, says this window attracted considerable attention with "corresponding increase in sales." That's the dope.



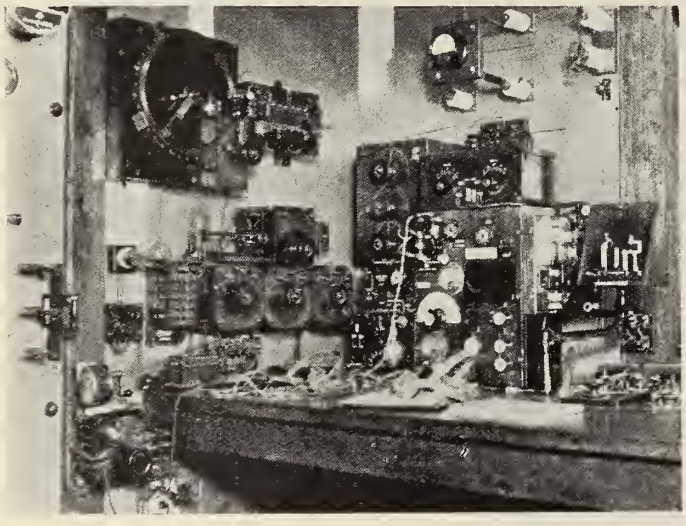
B. C. Wireless Progress

(Continued from page 87)

usual spark sets, thus, alternative methods of transmission are available for use as occasion demands.

The availability of alternative methods is also applicable to Victoria, at this station, however, the Poulsen Arc is superseded by continuous wave valve transmission, one of the latest and most important developments in the propagation of ether waves, and one which by virtue of its economical qualities and greater efficiency in all respects over other systems of transmission, must eventually be brought into general use. For reception, the stations are equipped with amplifiers, ranging from two to seven stages according to the nature of work performed.

As wireless services go the B. C. service is somewhat unique insofar as it plays a dual role, for in addition to looking after shipping interests a commercial service is run, which competes with existing land-wires between certain points. The main route for telegraphic traffic is between Vancouver and Prince Rupert, but many points intermediate and beyond are also served. Isolated localities devoid of telegraphic or telephonic facilities are linked in order that contact with the outer world may be maintained. Radio also provides the sole means of communication between the Queen Charotte Islands and the mainland, in addition to giving the only telegraphic outlet to several big industrial concerns operating plants along the coast.



Typical receiving apparatus in Coast station

Radio of Value to Industries

That communication is equally as essential to industry as to armies in the field is clearly demonstrated by the fact that many private companies maintain their own radio stations, who feed their traffic to the government service, who, in turn, relay on to its destination.

At Anyox, an important and active mining centre situated in the northern part of the province, the Granby Consolidated Mining, Smelting and Power Co. operate their own station; the Whalen Pulp and Paper Mills with plants at Port Alice, Swanson Bay and Thurston Harbour have an installation at each; the Pacific Mills Ltd. is another pulp and paper mill claiming private ownership at Ocean Falls. The Masset Timber Co. Ltd., a concern operating on a large scale at Buckley Bay, derive much benefit from their outfit; while the fishing and canning industry is represented by the Canadian Fishing Co., of Vancouver, who operate stations at their Butedale and Margaret Bay canneries.

In the near future radio facilities will be added which will be of considerable benefit to the province. Even as these lines are written a direction finding station which will assist mariners to determine their position at sea, is under construction. It is proposed to install wireless telephones on lighthouses and at various other points of industrial importance along the coast, the Yukon Territory is also due to receive attention.

Ideas that Have Sold Radio

Any dealer that wants to, can lay his hands on bags of technical radio literature. The market is flooded with complicated diagarms, tables and scientific advice. This stuff mostly goes to waste as far as the dealer is concerned. He needs to know enough about the material to sell it, but what really interests him is information that will keep the cash register ringing

The public does not buy radio headsets because of the wire used, or the quality of the steel in the magnets. They are interested in the durability and service they will get from the headset, and whether it feels comfortable or otherwise on the head. One salesman who is handling a good make of phone, sometimes drops them on the carpeted floor. He "lets on" that it was a slip, but the customer is always impressed with their substantial construction as the salesman immediately after connects them up to a set with an aerial across the ceiling and allows the customer to listen in.

A tale is told of one salesman who occasionally drops vernier condensers on the floor. He has confidence in the condenser and he does the stunt when he feels it is necessary to put a strong argument over. As a prominent radio man says: "Demonstrate the product in such a way that the layman can understand the logic of the sales plan and points. Talk in his language. Give the non-technical customer a sales talk and demonstration that will fit into his natural mode of living and in this way make the technical product as simple to him as a garden hose or an arm chair."

Personal Mention of a Few Other Prominent B. C. Electric Boosters

F. T. COPE & SONS

"Great oaks from little acorns grow" is an old familiar saying. This quotation might be applied to a business when conducted under capable and efficient management. 'Way back in '94 when Vancouver was not as large or important a city as it is today, but having all the earmarks of a "future," Fred T. Cope landed in town from the prairies—Brandon to be exact—and commenced to look about for an oportunity to establish himself in the business life of the city. He found the opportunity in the electrical business and it was not long before his sign was out at 149 Hastings St., directly opposite his present location. True, it was not a pretentious establishment, and as Mr. Cope, when recently recalling old times, smilingly admitted, the most of the stock was in the window and the shelves contained a goodly percentage of empty boxes. He recalled the time when, with considerable pride, he placed an order with an eastern wholesale firm for a barrel of knobs and a couple of coils of wire. Today a carload is not an unusual order.

With the growth of the city and under the capable management of Mr. Cope, the business developed and likewise, in the natural course of events, his two sons, Frank and Bert, grew up and became actively engaged in the business under the firm name of Cope & Son Ltd.

Try Cope

During the boom days of 1911-12 when building construction was at its height in Vancouver, the firm became prominently identified with construction as electrical contractors, the lighting equipment in several of the large business blocks built at that time having been installed by them.

Today the business of Cope & Son Ltd., occupies four entire floors in the heart of the business district, stocked with every conceivable piece of electrical appliance the buying public may desire. In fact it is an expression often heard: "Try Cope—you'll get it." Their retail store on the main floor, a photograph of which appears in this issue, is a model of up-to-dateness in electrical merchandising and is a credit not only to the owners but to the city of Vancouver. Among the exclusive lines carried by this firm are the Colin B. Kennedy radio supplies including receiving sets and Magnavox loud speakers, also the famous Baldwin head sets. They are sole agents for the "1900" electric washer. This firm's activities are not entirely centered in their wholesale and retail busines for out on Front street is located a factory completely equipped with brass foundry, tinning plant and all modern appliances for the manufacture of electrical goods including fixtures, panel boards, switchboards and steel cabinets. Here also is manufacured the Gane milking machine, a wonderful piece of mechanism for the sanitary handling of milk. The popularity of this machine is amply demonstrated in the orders received from New Zealand, Australia, California and the Prairie provinces of Canada. This factory gives employment to 35 skilled workmen.

To the faculty of knowing what the public want and a natural hobby for work may be attributed the success of Fred Cope from his meagre commencement 25 years ago. But although in all those years attention to business has received his first consideration he has at all times taken an active interest in the development of Vancouver and British Columbia, having had the honor of being elected the first president of the B. C. Manufacturers' Association.



B. F. Cope



F. T. Cope



Frank R. Cope

R. A. GRAHAM

Two years ago the Graham Electric Company of Vancouver had a thriving motor winding business but the proprietor, ever elert to improve the business, decided that the annual charge for non-productive labor or shop time, was too great. Such a condition, if improved, would mean a greater net profit at the end of the year. After carefully analyzing the situation he adopted the following plan which he submitted to his shop foreman and to his outside foreman:

The business was given a valuation at a certain



R. A. Graham

sum which equalled the inventory of physical assets plus a goodwill account to ten per cent. of the physical valuation. Both foremen were given an opportunity to buy an interest in the business on this basis. If a foreman ordinarily drew a salary of fifty dollars a week his account would be credited regularly with the salary earned and he withdrew what he needed for living expenses. The balance, which grew from wek to week at the end of the year represented his interest in the business. At the end of the year a bonus of five per cent. of the net profit is paid each foreman and then the surplus is distributed in proportion to the holdings of each partner in the firm. The foremen are given the option of following this plan or if they wish at any time to withdraw their savings from the firm the proprietor allows them interest at savings bank rate for the time he has had the use of the money.

This may sound like an Utopian idea but the balance sheet for the last two years has shown the soundness of the scheme. On a slightly reduced volume of business non-productive labor amounts to one-quarter of the former charge and the net profit of the firm has increased fifty per cent. over previous years. The little leaks that drain a business of this sort have been stopped—the foreman now is dealing with his own money and gets a maximum of efficiency from the men under him.

A weekly shop conference between the proprietor and the foremen is very helpful in bringing out small defects and in solving difficulities. The foremen take a keen interest in the progress of each job as the actual costs are checked against the estimates, and this interest frequently results in a saving on the estimates.

Perhaps the plan may sound impractical, but actual performance shows an esprit de corps in the whole organization which means a loyalty and interest that produces profits, but better still the plan has produced an increase of fifty per cent. in net profit.

After the first year the profit sharing plan was opened to the accountant and employees of over two years' service with the firm. They could leave their savings with their proprietor with the option of withdrawing the money at any time. Such loans are subject to interest and if the employee leaves his savings, however small, with the firm, at the end of each year he received a bonus of two and one-half per cent. of the net profit and interest on his money.

An organization, every member of which is working for a common end, is an organization hard to beat. Mr. Graham finds profit sharing pays. Ralph A. Graham, proprietor of the Graham Electric Co., Vancouver, is a member of the Vancouver Electric Club, secretary of the local association of Electrical Contractor-Dealers, and delegate from that organization to the Advisory Council of the Electrical Service League of British Columbia.

RANKIN & CHERRILL CO.

Mr. H. V. Rankin is another Ontario boy who heard "the call of the West" and in 1899 migrated from his home town of Stratford and came to Vancouver, B. C. Mr. Rankin became associated with



H. V. Rankin

electrical work soon after arriving on the Coast and in 1904 commenced business on Hastings street as the Rankin Electric Company. In 1906 he entered into partnership with A. Cherrill and since that time the business has been carried on under the firm name of Rankin & Cherrill although the partnership

was dissolved in 1915, Mr. Rankin taking over the interest of his partner.

Upon entering the store of Rankin & Cherrill, at 55 Hastings St. W., one is at once impressed with the neatness and attractiveness of the display. Here can be found a most complete stock of electrical appliances, fixtures, ranges, washing machines, vacuum cleaners, radio sets and electrical supplies. A photograph of the store is shown in this issue. The firm has for several years been district sales agents for the Century motors and carry all sizes in stock for immediate delivery. In addition to their retail business they have built up a successful wholesale and jobbing business and are well and favorably known among the British Columbia contracting firms.

P. F. LETTS

P. F. Letts, electrical contractor-dealer of Vancouver, B. C. conducts an electrical store at 3044 Granville St. on the edge of the fashionable Shaughnessey Heights residence district of Vancouver. Percy, as he is known to his friends, had a very considerable experience in the electrical business in England and in the United States prior to starting



Percy F. Letts

business in Vancouver. He was secretary of the local Association of Electragists, International, last year and was appointed delegate to the International Convention at Cincinnati, which he atteded as alternate for C.H.E. Williams local committeeman. For two years Mr. Letts has been a delegate to the Electrical Service League of British Columbia from the contractor-dealers association and is at present secretary of the Electrical Convention to be held in Vancouver July 27th.

The municipality of the City of Merritt, B.C., owns its own system, with a capital investment of $70,000.00. The generating plant contains a vertical type steam engine, 200 h.p. capacity, connected to a 125 kw,. 60 cycle, 3-phase generator. D. Forsyth, city engineer, has charge of the plant.

J. F. LITTLE

J. F. Little, manager of the Vancouver branch of the Northern Electric Company, studied electrical engineering at Toronto University and has a wide experience in the electrical business. He was employed by the Western Electric Co. at Chicago for



F. J. Little

nine years and has been in the employ of the Northern Electric Co. for thirteen years. He is a member of the Terminal City Club, Jericho Country Club and the Electric Club. He has served three years on the Advisory Council of the Electrical Service League of British Columbia and is a strong booster for co-operative effort in the promotion and development of the "Electrical Idea."



W. C. Mainwaring
District Sales Manager, Northern Electric Co., Vancouver

Three Prominent Electrical Contractor-Dealers



C. C. Carter



W. W. Fraser



E. Brettell

League Work—Its Purposes, Possibilities and Limitations

A representative of the Society for Electrical Development in the person of Kenneth A. McIntyre, addressed a joint dinner of the members of the Vancouver Association of Electragists, International, and the Electrical Service League of British Columbia, at the Hotel Elysium, Tuesday evening, June 26th. The entire industry was very well represented. In the absence of Mr. E. E. Walker, chairman of the Advisory Council of the Electrical Service League, John R. Read, local manager of the Canadian Westinghouse Company, presided.

The subject of Mr. McIntyre's address was "League Work—its purposes, possibilities and limitations." The speaker stated that co-operative work was preparing the consumer through various mediums of publicity for the individual effort of the contractor-dealer, manufacturer, jobber and central station representative. He stressed the point that co-operative work could never hope to supplant the results of individual effort, but that through co-operation the individual could receive the benefit of much publicity which could not be financed by any particular branch of the industry alone. He also stressed the fact that the electrical field was far from saturation, either as to wiring, lighting or appliances, and that the industry as a whole must not overlook the opportunity afforded through League work to break down resistance on the part of the public, which barrier must be broken down through education.

Following the address an open forum was held for an hour, the chief topic under discussion being the solution of the present unsatisfactory system of distribution, which gave the contractor-dealer branch of the industry little or no protection as against large consumers. It was apparent from the number of contractor-dealers who spoke on this point that the question of protection as against consumers is of vital importance to that branch of the industry and the problem must be solved at no far distant date by the industry as a whole.

C.P.R. To Electrify

Plans for the electrification of the C.P.R. main line through the Rocky Mountains, so far as the heavy grades are concerned, are said to be receiving close attention from the officials of the company. Surveys of the water power available on the Columbia River have been carried out at such points, for example, as the Surprise Rapids, about 32 miles south of Beaver Mouth. This matter has been under consideration, of course, more or less for some years, but the increasing traffic demands would appear to be bringing the time closer when steam must give way to electricity in the operation of the heavy grades on the C.P.R. system.



S. E. Jarvis, another well-known contractor-dealer

West Kootenay Power and Light Company Limited

Rossland, B. C.

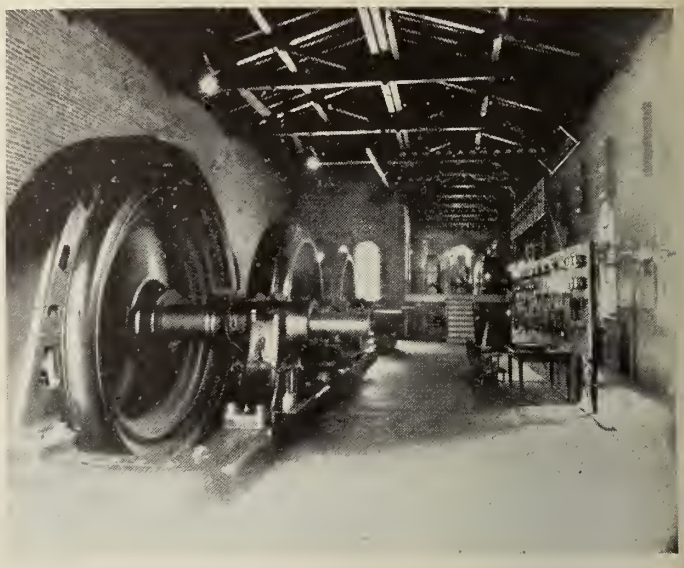


No. 1 Power House, Lower Bonnington Falls, Kootenay River

This power plant operates under average head of 37 feet. Three Victor horizontal double runner turbines, developing 3,648 H.P. Two 750 K.W. and one 1,500 K.W. Canadian General Electric, A.C., 3 phase, 60 cycle generators. Total plant capacity 3000 K.W. Three 12″, 40 H.P. turbines, driving three 30 K.W. generators, exciting; 4 banks of 1,000 K.W. each, Canadian G.E. single phase, air cooled transformers; voltage—1,100 primary, 22,000 volts secondary.



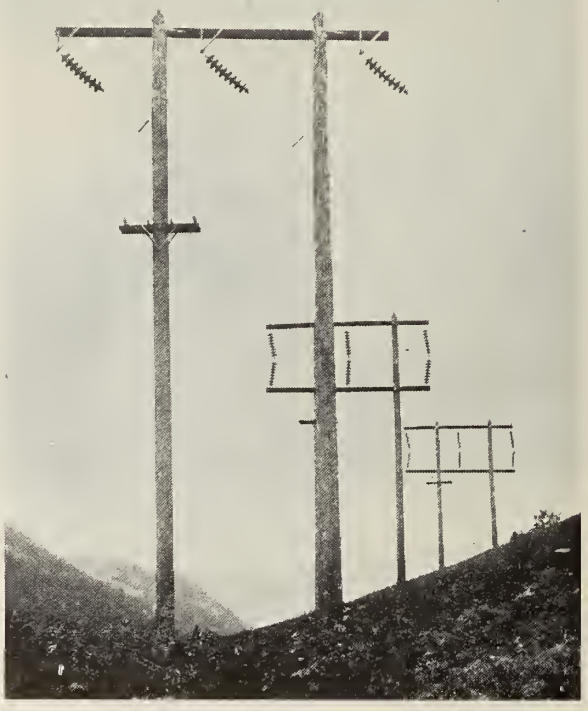
West Kootenay P. & L. Co.—No. 2 plant, Upper Bonnington



West Kootenay P & L. Co. No. 1 plant, Lower Bonnington

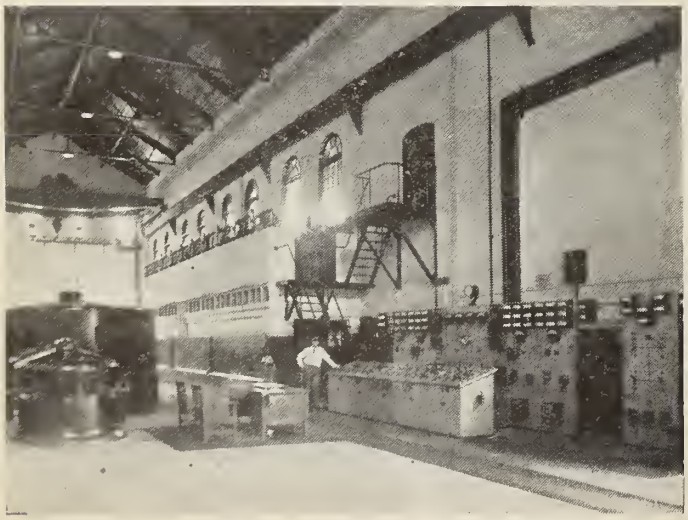
West Kootenay Power and Light Company Limited

Rossland, B. C.



West Kootenay 110,000 v. line showing heavy curve with uplift

The accompanying illustrations show the up-to-date equipment of the company and indicate the wide scope of its operations.



West Kootenay P. & L. Co.—Interior Upper Bonnington



1500 kv.a. outdoor step-down station—West Kootenay L. & P. Co.

West Kootenay Power and Light Company, Limited

Rossland, B. C.



No. 2 Power House, Upper Bonnington Falls, Kootenay River

Plant (installed 1906) operates under average head of 70 feet. Two Morris-Francis and Two Allis-Chalmers-Francis vertical turbines, developing 32,000 H.P. Four vertical type Canadian G.E., A.C., 3 phase, 60 cycle generators. Total plant capacity, 21,000 K.W. Two 500 H.P. turbines driving two 150 K.W. generators exciting. Transformers—2 banks of 3 Canadian Westinghouse, single phase, water cooled, oil insulated, each 2,000 K.W.; 2 banks of 3 ditto, 1,875 K.W.; 1 bank of 3 ditto, each 1,250 K.W. Voltage—2500 primary, 60,000 volts secondary.

Current News and Notes

Belleville, Ont.

Experiments conducted by T. Gilmour, of the Marconi Co. at the Ontario School for the Deaf, in Belleville, Ont., indicate that radio will enable the deaf to hear.

Brantford, Ont.

Mr. William Thorbeck, formerly with the Hoover company, is now covering Essex and Kent counties for Onward Manufacturing Company, handling the Sunny-suds washer and the Eureka vacuum cleaner.

The Bell Telephone Company are laying 25,000 feet of conduit in Brantford, Ont.

Calgary, Alta.

The financial statement of Calgary Power, which will be submitted to shareholders on July 16th, shows that the gross revenue for the year totals $306,-808, as compared with $303,724 the previous year. Operating expenses, bond interest, taxes and other charges, payable out of revenue absorbed $212,030, leaving a net profit for the year of $94,777, as against $74,352 for 1921. Referring to the expansion plans of the company, President Drury says:—"During the latter part of 1922 investigations were commenced by competent engineers employed by your company, of the possibilities of development of additional water power, sites and storage adjacent to your company's plants on the Bow River, to enable the company to meet increasing demands for power. Indications were such as to warrant a detailed examination and survey which are now being carried on. Application has already been made to the Federal Government for the water rights at the sites under investigation."

Edmonton, Alta.

A fine electric clock is one of the latest civic improvements to have been installed in Edmonton. The dials and globes are constantly illuminated.

Fredericton, N.B.

Hon. Joseph E. Michaud has been appointed a member of the New Brunswick Electric Power Commission.

Halifax, N.S.

Mr. Harry Dearle is making a six weeks' trip through the maritime provinces in the interests of the Onward Manufacturing Company, handling 'Sunny-suds' Washers and Eureka cleaners.

Hamilton, Ont.

The Onward Manufacturing Company are opening a district sales office in Hamilton, to take care of the Niagara Peninsula. Mr. George Bonycastle, formerly with the Nineteen Hundred company in Winnipeg, will be in charge of this office.

The Canadian Westinghouse Company has let the contract for the construction of a $200,000 unit addition to its plant in the west end of the city to W. H. Yates Construction Company. This is the first of a series of buildings that will run into a total value of $1,500,000.

Kitchener, Ont.

The light commission, following the decision of the light committee of the city council some months ago will restore all the street lights which were taken off during the war as a measure of economy. Over 400 were removed and only about half have been put back.

Mission City, B.C.

The Western Canada Power Co. has taken over the plant of the Windebank Electric light and will in future supply Mission City, B.C., with current for light and power. The commissioners have ordered 70 street lights for an area of half a mile square.

Moncton, N.B.

The New Brunswick Hydro Commission has received applications for current from practically all the villages between St. John and Moncton, adjacent to the hydro line, and requests for extensions are being steadily pressed.

OPPORTUNITY FOR ELECTRICAL BUSINESS

For Rent—Double front store combined with 6 roomed solid brick dwelling in busy section of Toronto. Ample accommodation for stock. Small competition for electrical trade. R. Pellettier, 1157 Davenport, Toronto, or phone Hillcrest 5838. 14

BUSINESS CHANCES

are best found by reading the Constructional Activity pages of the CONTRACT RECORD AND ENGINEERING REVIEW each week. Advance information on hundreds of buildings, homes, factories, etc., in every issue gives you an opportunity of writing or calling upon men who you know to be in the market for wiring and electrical devices. Subscribe today. Only $3.00 per year. Contract Record, 349 Adelaide St. West, Toronto. 13T.f.

FOR SALE

Canadian Patent on newest electrical labor saver for kitchen use. Sold by best dealers in U.S. for two years past. Sales increasing monthly. Will bear closest scrutiny. No agents considered. Suitable for big electrical manufacturing plant. For particulars address Kollins Kitchen Kraft, 426-8 S. Wabash Ave., Chicago, U.S.A. 12-15

FOR SALE

25 cycle, 12000 and 13200 volt primary, 2300 volt secondary, transformers, indoor type, sizes as follows:-

1—750 K.V.A. Packard 3 phase water cooled.

3—300 K.V.A. Westinghouse, single phase, self cooled.

3—150 K.W. Packard, single phase, self cooled also 575 volt secondary.

For further details and prices, please write "The Public Utilities Commission," St. Catharines, Ont. 14



Section of 250,000 C.M. 3-condr. 13200 v. cable
manufactured by us to the specifications of
TORONTO HYDRO ELECTRIC SYSTEM
to whom we have supplied a total length of
cable to the same specifications of
369,270 Feet = 70 Miles

Eugene F. Phillips Electrical Works, Limited

Established 1889

MANUFACTURERS OF:

Copper Rods—Round or Flat
Bare Copper Wires & Cables
Trolley Wire—Copper or Cadmium—Copper
Magnet Wire
Enamelled Wire
Rubber Insulated Wires and Cables
Weatherproof Wires and Cables
Flexible Cords
Paper Insulated Power Cables
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Executive Offices - - - MONTREAL
Factories - - - - - - MONTREAL & BROCKVILLE



No. 1138

Electrical Fixtures which harmonize with the most elegant surroundings.
Our catalogue will bring you new ideas. Write today.

Lightolier Mfg. Co., Limited
40 St. George St., Montreal

KENNEDY
Water Power Plant Machinery



KENNEDY'S OWEN SOUND

STOPLOG WINCHES

The unusual ability of Kennedy Stoplog Winches may be gathered from the fact that on one occasion the mass of ice, snow and logs, when lifted by this 27-ton motor driven winch was estimated to weigh 90 tons!

The Wm. Kennedy & Sons, Limited
OWEN SOUND ONTARIO.

District Representatives:

M. B. SAUNDERS, 8 Silver St., Cobalt, Phone Cobalt 153

Maritime Rept.: C. A. FOWLER, Tramway Bldg., Halifax, N. S.

H. C. KENNEDY, 232 St. James St., Montreal Phone Main 394

Running Hot or Boiling Water Instantly at Low Cost



Easily attached to any water faucet and with this Instantaneous Electric Water Heater you get clean sterilized hot or boiling running water right out of the faucet, all day if you desire. Cold water out of the same faucet by just a turn of the handle. Can be operated on either direct or alternating current.

Convenient in the shop for washing the grease or dirt off your hands or instantaneous sterilized water for first aid rooms. 4,000 in daily use—Write for agency proposition.

The Aqua Electric Heater Co.
of Canada Limited
50 Notre Dame St. West Montreal

The manufacturer who makes the article is helpless without the merchant who makes the market

Reach your market through "Electrical News"

Retail Marketing Tips

Washing Machines

—And How to Sell Them

What Happened in Dollarville

About a year ago, an Electrical News representative found he had to wait three hours between trains in a small Canadian city, which we may call Dollarville. He used the time to make a rapid survey of the electric washing machine business. Here is what he found:

(1) Nobody sold washers on the instalment plan.
(2) Two local electrical dealers stated that they sold machines when customers asked for them.
(3) Everybody was working and there was lots of money in the town.

This state of affairs seemed to promise a grand opportunity for a man who would go after the business. The Electrical News man caught his train, but the town held his interest. A few days ago, an enquiry about Dollarville brought an interesting reply from a washing machine manufacturer:

"Johnson is the big stick in that town. He used to sell sewing machines, but he went in with his brother-in-law in the Electric Shop. Believe me, he has sold some washers—200 in 6 months. Just advertising, canvassing and the instalment plan. I wouldn't want to lose that agency. The rest of them had just been letting that business slide"—and so on at great length.

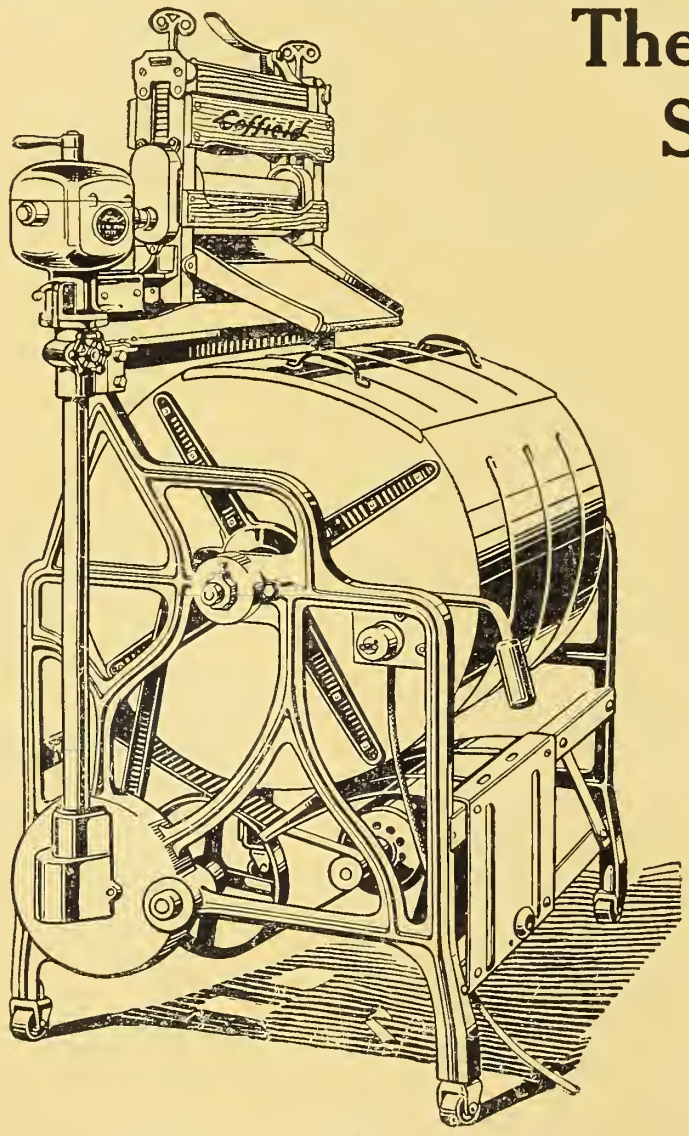


Are there other Dollarvilles where Old Man Opportunity is still running around loose?

Coffield

ELECTRIC WASHER

"Makes the prettiest, cleanest clothes that ever came out of suds"



Model D

$125 RETAIL PRICE IN ONTARIO

$135 IN QUEBEC MARITIMES AND WESTERN PROVINCES

Note—(The retail price in United States on Model D is $140)

The Coffield Washer Sells Rapidly---Because

dealers and their customers have implicit confidence in its performance, convenience, durability and economy. It stands to-day as "perfect" along with the thousands of Coffields built during the past nineteen years.

Superior Features

(1) The Coffield runs quietly, without creeping or vibration.
(2) chemically treated bearings do not need oiling or adjusting.
(3) Oscillating copper tub, rocks within the frame — leakless, rust-proof and self-cleaning.
(4) Swinging wringer has extra wide rolls. Is instantly reversible because of patented "touch o' thumb" water shutter and stationary drain boards. Locks in eight positions. It will not sag, is easily controlled and perfectly safe.
(5) The Canadian Westinghouse Motor of special enclosed type has ample power, is well protected, yet easily accessible.
(6) Patented clutch operates the Coffield without jar or vibration.
(7) Patented, protected leakless drain swings inside the washer frame. Faucet cannot screw clear out. Empties both sides of tub at once. Spout is threaded for hose attachment.
(8) The Coffield is handsome and graceful with its polished copper tub and aluminum finished, cast iron frame.

Dealers Wanted

—in unrepresented territory. We have a profitable discount proposition to offer you in connection with Coffield Electric Washers which are in demand and readily sold. Write us today regarding your territory.

Made in Canada by

The Coffield Washer Company of Canada, Limited

HAMILTON CANADA



Connor Perfection
Electric
Swinging Wringer

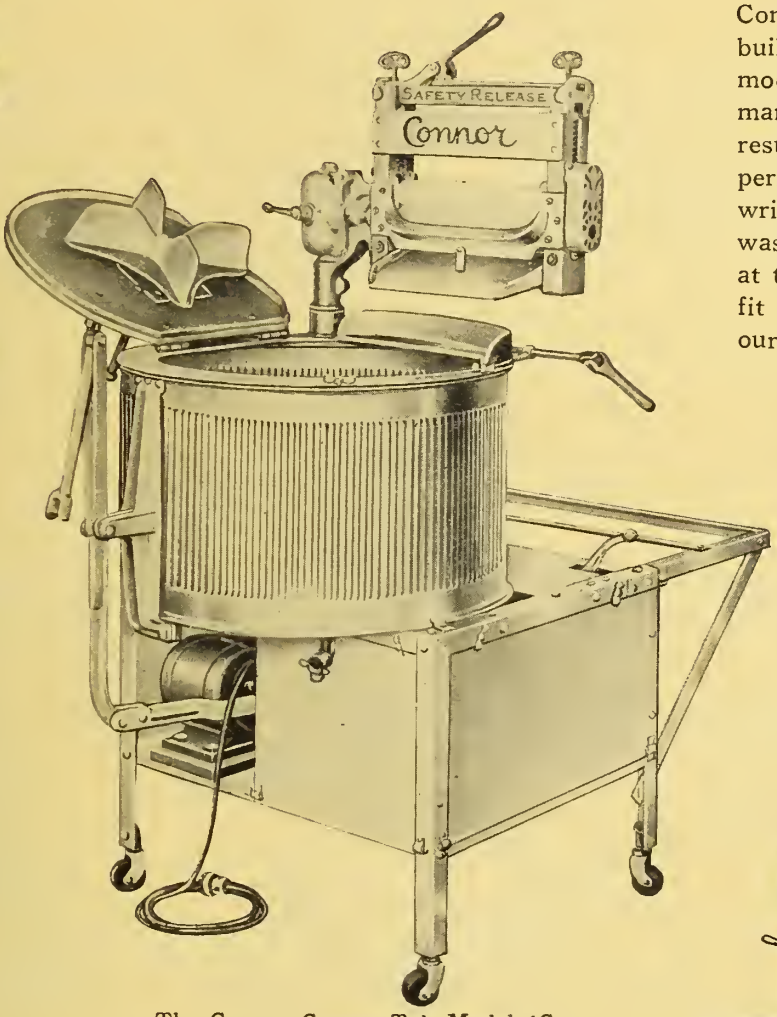
There's an Electric Washer to Suit Every Prospect in the Famous Connor Line

Connor Electric Washers built in four different models, meet every demand. They are the result of long years of experience in washer and wringer building. Every washer guaranteed. Look at the prices, a good profit for dealer shown, get our trade discounts.

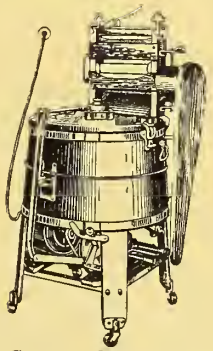
See This New One

MODEL 4C

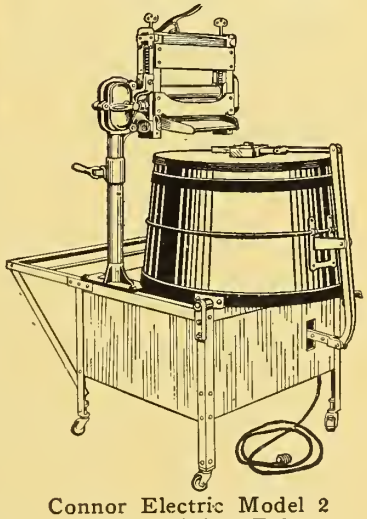
This latest addition to our line is filling a long-felt want. It possesses many special features—polished copper tub and polished aluminum cover, polished aluminum feed board and drain board of 12" swinging wringer, extension folding bench—these and many other special devices make an instant appeal.



The Connor Copper Tub Model 4C



Connor Economy
Stationary Wringer



Connor Electric Model 2
Wood Tilting Tub
Swinging Wringer

Mr. Dealer-- Ninety-Five out of One Hundred women you talk to, in your store or through your ads., use the dolly type hand or water power washer. When you show them the Connor four winged dolly, they know, from experience, you are right. Why not recognize the advantages of our four, different, models operating on same principle, meeting the buying ability of different people.

J. H. Connor & Son Ltd., Ottawa, Ont.

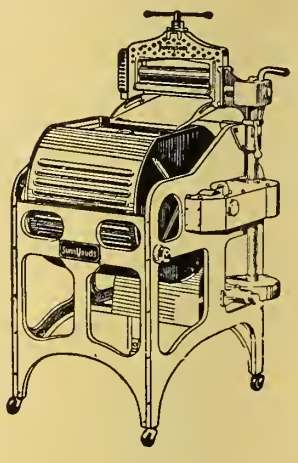
311 Chambers St., Winnipeg, Man.

Leadership In Less Than Three Years

Sunnysuds' record not surpassed by any other product in the household appliance field

THE reasons that have brought the Sunnysuds right up among the leaders in less than three years are the same reasons that will make this remarkable machine still greater in the future. Sunnysuds' success can be your success, too. But you must act quickly. There are only a few territories still open for the Sunnysuds agency. If you are interested, drop us a line to day, and we shall be pleased to send you complete details —no obligation, of course.

Added Improvement
Equipped with safety switch which automatically prevents overloading and blowing fuses.



Onward Manufacturing Company
Kitchener - - Ontario

Mr. Dealer, Figure the Possibilities of Your District



for the sale of electric washing machines. Read the first page of this insert, and look over the washing machine advertisements. They present for your selection the most reliable and best known machines, offering you a means of making worth-while sales and liberal profit.

Make Your Washing Machine Sales Count

ELECTRICAL NEWS **347 Adelaide St. W., Toronto**

HIGHGRADE
BRUSHES



Carbon, Graphite, Metal Graphite

For ALL TYPES of Motors and Generators

Made in Canada

Orders shipped Promptly

DOMINION CARBON BRUSH CO
38 Duke St., TORONTO
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Lightning
S. & C. Protection

Send for New Bulletin 204, Which Gives All the Details

The George C. Rough Sales Corporation
313 St. Nicholas Building
Montreal

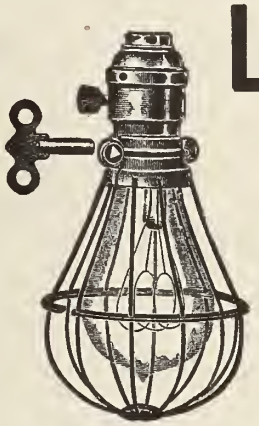
International Business Machines Company
LIMITED
300 Campbell Ave., Toronto

Manufacturers of International Electric Time Systems, comprising Master Clocks, Secondary Wall Clocks, Bell-ringing Programme Devices and Automatic Charging Cabinets.

Complete Electric Time Systems for Schools, Colleges, Public Institutions, Office Buildings, Factories, etc.

LAMPS Locked On Can't Get Stolen

They can't get knocked out or broken.



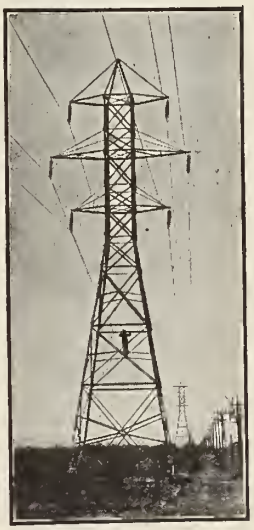
LOXON

guards give your lamps just such protection.
Sold at a popular price. Our Loxon Lamp Guards and other Specialties demand the attention of every handler of Electrical Goods.

Let us send our list.

McGill Mfg. Co.
Valparaiso - - Indiana
U. S. A.

GALVANIZED STEEL TOWERS AND POLES



Standard Tower Hydro Electric Power Commission of Ontario

The modern means of supporting overhead wires.

Power
Telephone
and
Trolley
Lines

We shall be pleased to furnish designs and estimates upon request.

The Canadian Bridge Co., Limited
Walkerville, Ontario, Canada
Structural Steel of all Kinds
Montreal Office in New Birks Building.

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British Aluminum Company
Canada Wire & Cable Co.
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Canadian National Carbon Company

CARBONS
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Canadian Westinghouse Company

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Canadian General Electric Company
Canadian Allis-Chalmers Company

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Boving Hydraulic & Engineering Company

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Canadian Drill & Electric Box Company

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Canadian General Electric Company
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Diamond State Fibre Co. of Canada, Ltd.

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Powerlite Devices Limited
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FIXING DEVICES
Inventions Ltd.
Rawlplug Co., of Canada

FLASHLIGHTS
Canadian National Carbon Company
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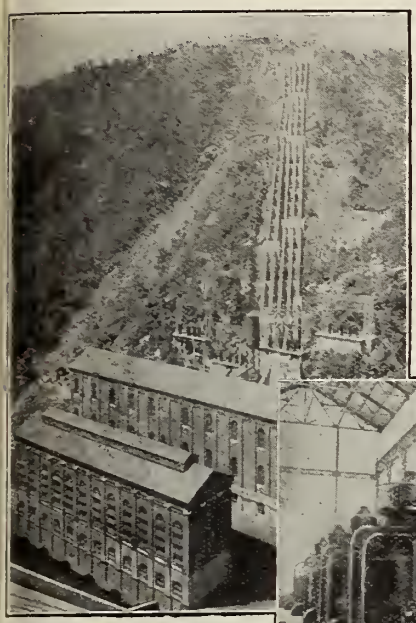
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Slater, N.

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Ferguson, Pailin Ltd.
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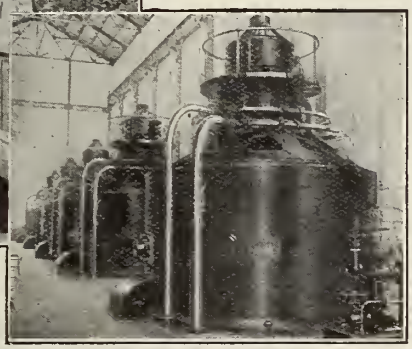
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4—	½ H.P.	110/220V.	1425 RPM.	Wagner.
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1—2	H.P.	110/220V.	1465 RPM.	Peerless.
2—2	H.P.	110/220V.	1440 RPM.	Wagner.

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1—	¼ H.P.	110V.	1725 RPM.	Aro.
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1—10	H.P.	220V.	1500 RPM.	T and H.
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1—2	H.P.	220V.	600 RPM.	Gen. Elec. Co.
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1—7½	H.P.	220V.	1200 RPM.	Alllis-Chalmers.
1—7½	H.P.	220V.	1200 RPM.	Gen. Elec. Co.
1—8	H.P.	220V.	1800 RPM.	T and H.
1—15	H.P.	220V.	1800 RPM.	Crocker-Wheeler.
1—20	H.P.	220V.	900 RPM.	Westinghouse.
1—50	H.P.	2200V.	940 RPM.	2 Ph. Westgh. T. CCL.

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HAMILTON ONTARIO

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Canadian General Electric Company
Canadian Westinghouse Company
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Thomson Company, Limited.
Toronto & Hamilton Electric Company

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Canadian Fitzgerald Mfg. Co.

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Smith Company, S. Morgan

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Masco Company
National Electric Heating Company
Northern Electric Company
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Kennedy, William & Sons

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Henderson Dalyle Co.
Joyner, Co. Ltd., Winter
Jefferson Glass Company

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MacGillivray, G. L. & Co.
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Edmunds, J. H. & Co., Ltd.
Joyner, Co. Ltd., Winter
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Powerlite Devices Ltd.

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Canadian Westinghouse Company
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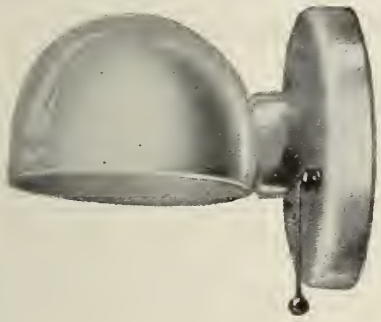
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Smith Company, S. Morgan

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"Direct-Acting Steam Pumps" by Frank F. Nickel. Published in 1915 by McGraw-Hill Book Company. 258 pages illustrated. Price $2.00.

"Electric Railway" by A Morris Buck, M.E. Published in 1915 by McGraw-Hill Book Company, Inc. 390 pages, illustrated. Price $2.50.

"Engineering Electricity" by Ralph G. Hudson, S.B., 190 pages Illustrated. Published in 1920 by the John Wiley & Sons, Incorporated. Price $2.00.

"Handbook of Machine Shop Electricity" by C. E. Clewell. Published in 1916 by McGraw-Hill Book Company. 461 pages, illustrated. Price $2.50.

"Principles of Alternating Current Machinery" by Ralph R. Lawrence. Published in 1916 by McGraw-Hill Book Company. 614 pages, illustrated. Price $3.50.

"Radiodynamics"—The Wireless Control of Torpedoes and Other Mechanisms, by B. F. Miessner. Published in 1916 by D Van Nostrand Company. 206 pages, 112 illustrations. Price. $1.50.

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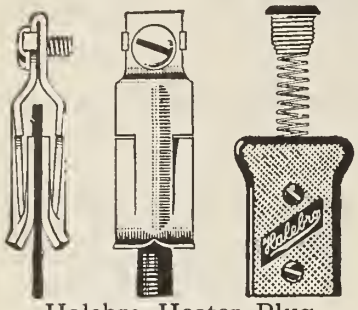
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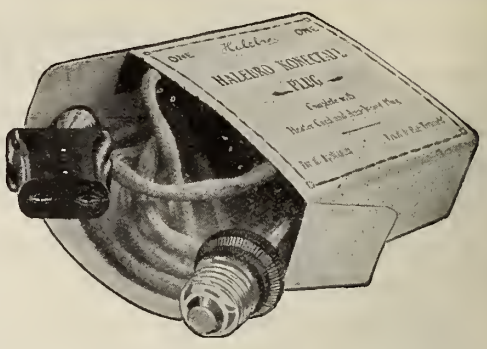
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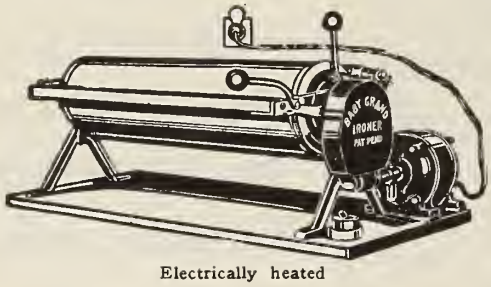
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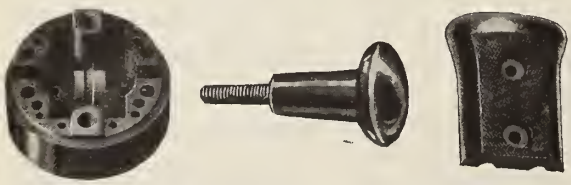
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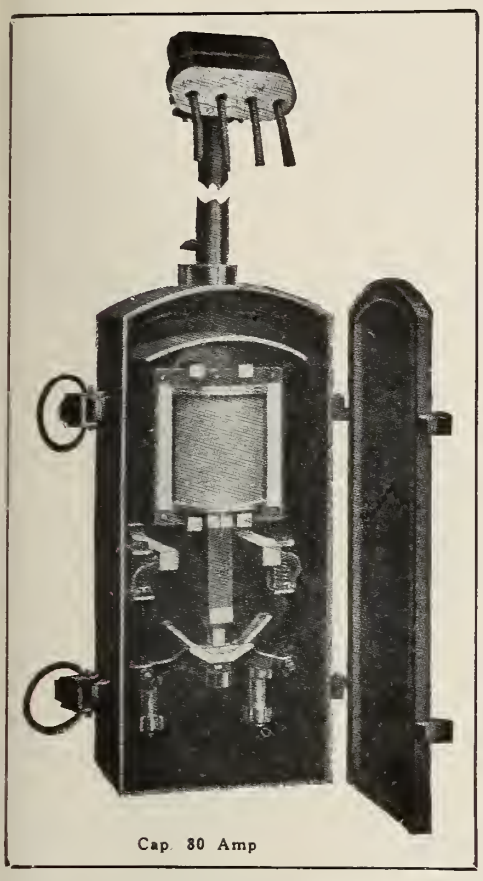
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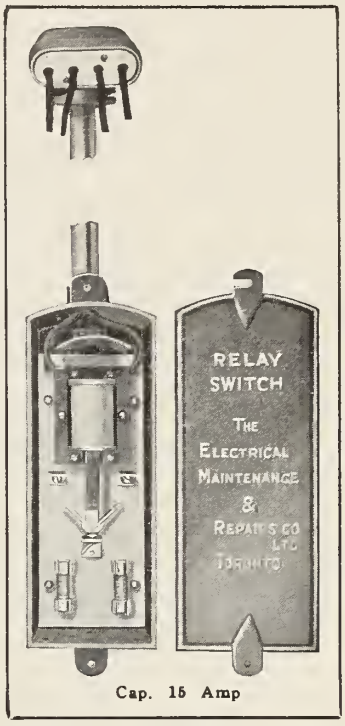
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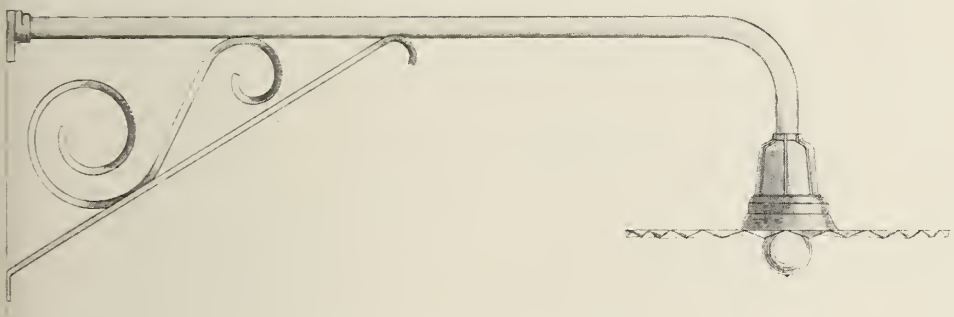
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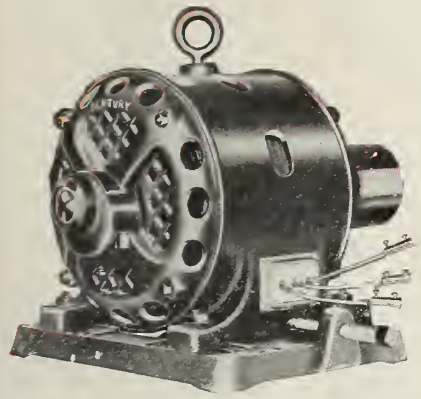
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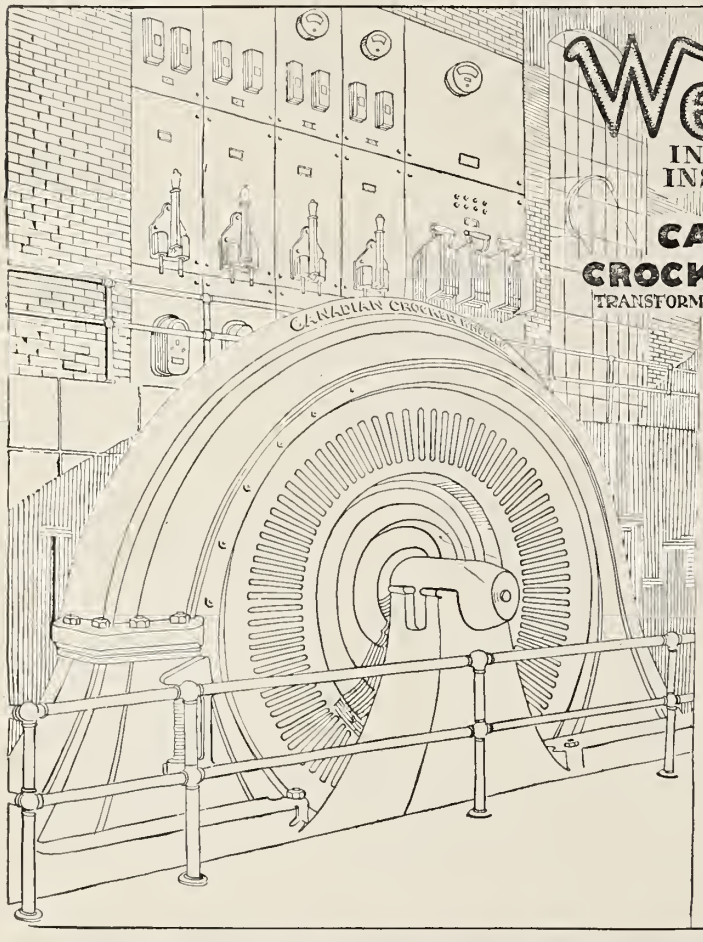
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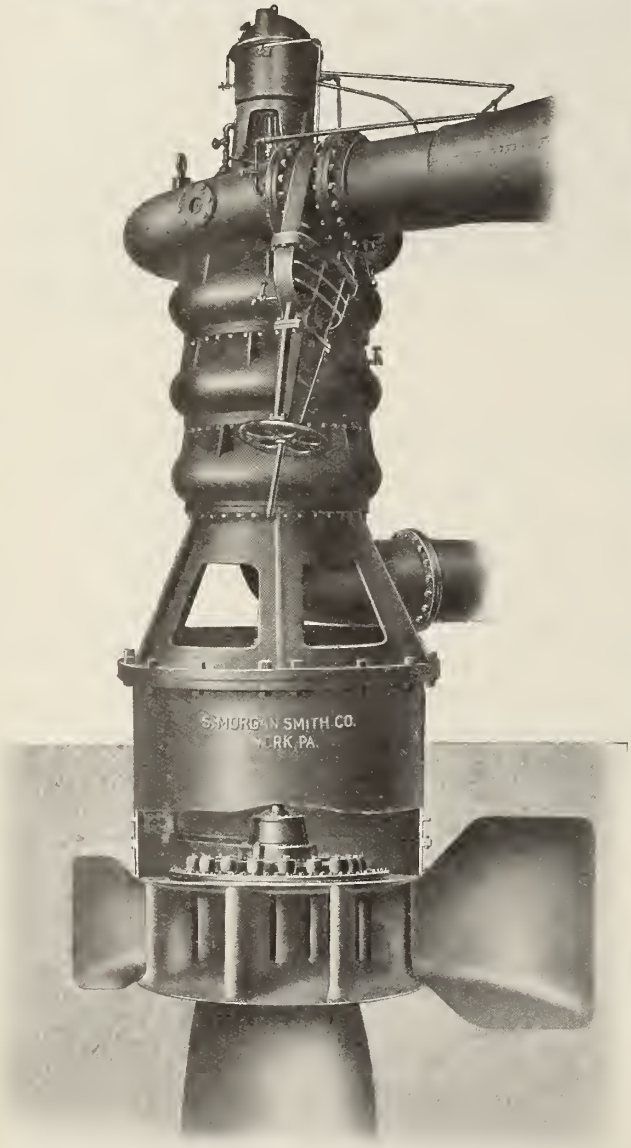

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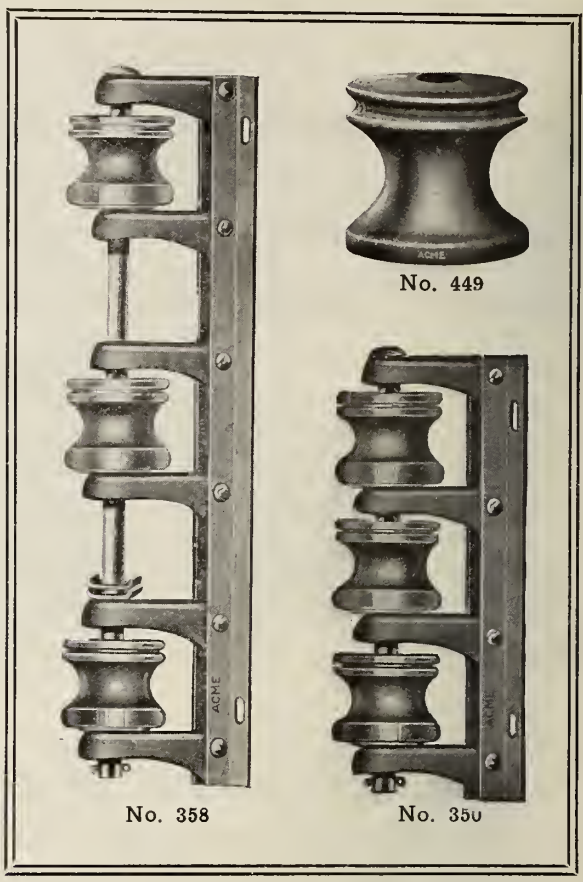


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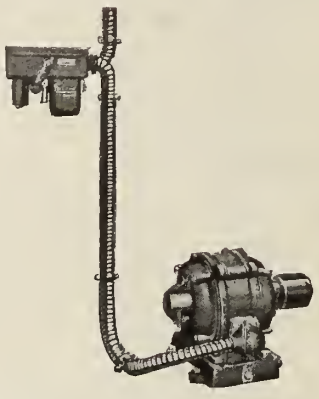
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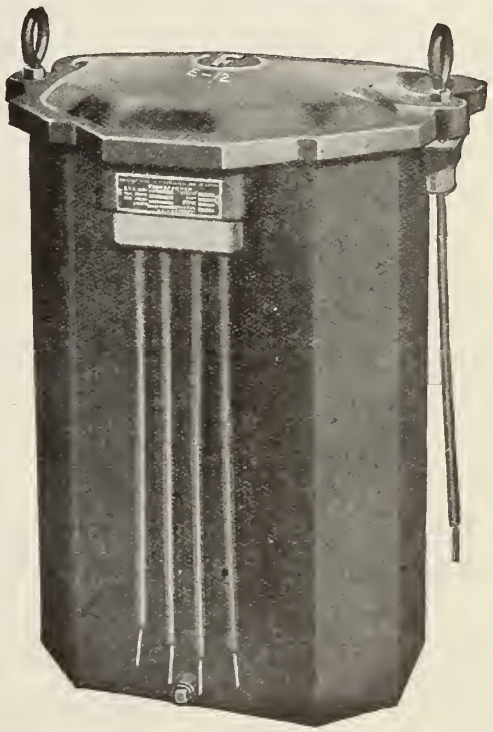
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Ward Leonard Electric Co. .....
Walker & Sons, Hiram .....
Wagner Electric & Mfg. Co. .....
Wiggin & Co. Ltd., Henry 30
Winter Joyner Co., Ltd. 34

Rubber Covered Wires and Cables

FOR POWER, LIGHT AND TELEPHONE WORK

Incandescent Lamp Cord, Flexible Switchboard Cables, Special Cords and Cables for all kinds of Electrical Work.

Prompt Shipments from Canadian Factory.

BOSTON INSULATED WIRE & CABLE CO., Limited

Canadian Office and Factory, HAMILTON, ONT.



A Galvaduct Building
American Can Company, Limited, Plant, Montreal, Que.
Canadian Comstock Company, Electrical Contractors

"GALVADUCT"

"Galvaduct"

The most perfect interior construction conduit on the market.

Recognized as the standard of high quality.

Always specify Galvaduct or Loricated.

Conduits Company Limited

Head Offices and Factory
Toronto

Western Sales Offices:
Winnipeg and Vancouver

"Loricated"

A high-class interior construction conduit of the enamelled type, proof against acid or other corrosive agents.

If your jobber cannot supply you—write us.

"LORICATED"



Joseph Sawyer, Montreal, Architect.
Century Electric Co., Montreal, Electrical Contractors.

Holtzer-Cabot

Hospital Signal Systems

Sainte Justine Hospital at Montreal, Canada, is another of the ever increasing modern hospitals, Holtzer-Cabot equipped.

For fifty years the Holtzer-Cabot Electric Co. have been leaders in the manufacture and development of electrical Signal Systems and today many of the country's leading architects are specifying Holtzer-Cabot Systems exclusively.

Architects, engineers and members of building boards are invited to write for brochures entitled "Signal Systems for Hospitals" and "Signal Systems for Schools."

Our engineers are at the service of architects and their clients at all times; just comunicate with our nearest office.

The Holtzer-Cabot Electric Co.
Electrical Signaling Systems
Home Office and Factory
125 Amory Street, Boston, Mass.

BRANCH OFFICES:
Chicago, Ill. 6161-65 So. State St., Cleveland, Ohio, 517 Union Building. New York, N.Y., 101 Park Ave. Baltimore, Md., 1104 Union Trust Bldg. Philadelphia, Pa., 807 Otis Bldg. San Francisco, Cal., 408 Claus Spreckels Bldg. Detroit, Mich., 1051 Book Bldg. Minneapolis, Minn., 627 Metropolitan Life Bldg.

"Notice the Lighting Equipment"
"Everywhere you go"

It's a beauty---

The NEW BANFIELD universal APPLIANCE PLUG



FEATURES

Substantial Bakelite composition. The triangular top makes a convenient and handy grip.

May be used for appliances with flat, round or square contacts.

Contact members made of heavy spring brass with flanged edges, ensuring continuous contact.

HERE is the ideal little accessory to sell to the woman who has "Dropped her electric-iron plug on the floor."

The fact that she can use the same plug in the iron with its flat contacts, or in the toaster or percolator where the contacts are probably round is certainly an appealing feature.

The illustration tells the story of its appearance —this is the 100% perfect appliance plug.

W. H. BANFIELD & SONS Limited

370-386 Pape Ave., TORONTO

MONTREAL
A. B. Cornwell, 51A Sussex Ave.

WINNIPEG
Cochrane, Stephenson & Co. Ltd., 602 Avenue Block

VANCOUVER
Cochrane Stephenson & Co. Ltd., 901 Credit Foncier Bldg.

Since men and women know that electricity adds so much convenience to their homes, it is reasonable for them to insist upon getting it



No!—my house must have modern wiring

Many a builder has wished he had given more thought to the final touches of convenience which he might very easily have put into a house—the little touches which mean a great deal to home-buyers, especially women.

In these days when women do so much of their housework electrically, many a house has been sold on its wiring alone.

C.G.E. Wiring Devices are the outgrowth of years of intimate knowledge of the requirements of house-owners. There are over 3,000 C.G.E. devices, covering every possible requirement.

All of them are good-looking, blending well with the architecture. They are so sturdy that they will last as long as the house itself.

It is to your interest to show the builders of your neighborhood the sales-getting possibilities of adequately wiring their houses. Electric homes will be more and more in demand during the next few years.

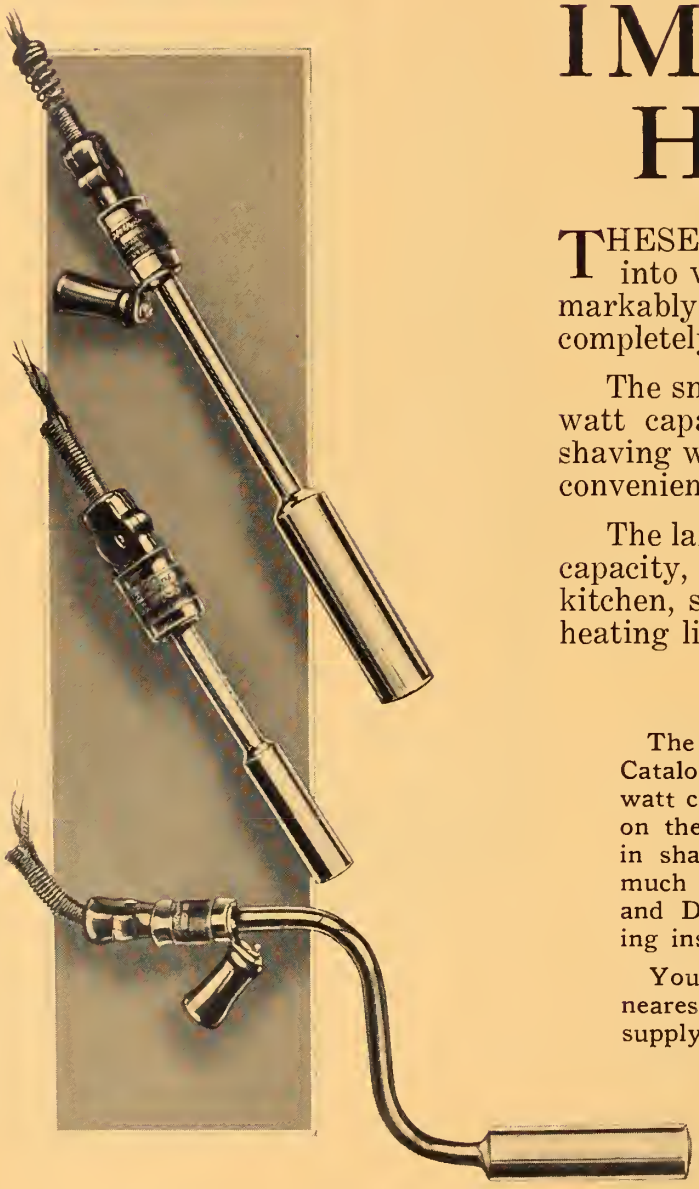
"Made in Canada" by

Canadian General Electric Co., Limited

HEAD OFFICE TORONTO

Branch Offices: Halifax, Sydney, St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

Hotpoint



IMMERSION HEATERS

THESE appliances quickly heat any liquid into which they may be placed, and are remarkably efficient as the heating elements are completely surrounded by liquid.

The small size, Catalogue No. W15, is of 300 watt capacity and is invaluable for heating shaving water or babies' bottles. It is also very convenient for travellers.

The larger size, Catalogue No. W16, 500 watt capacity, may be put to innumerable uses in the kitchen, such as keeping soups, etc., hot or for heating liquid foods of all descriptions.

The crookneck type Catalogue No. W17, 500 watt capacity, will lie flat on the bottom of a dish, in shallow liquid, and is much used by Doctors and Dentists for sterilizing instruments.

Your jobber or our nearest Sales Branch can supply you.



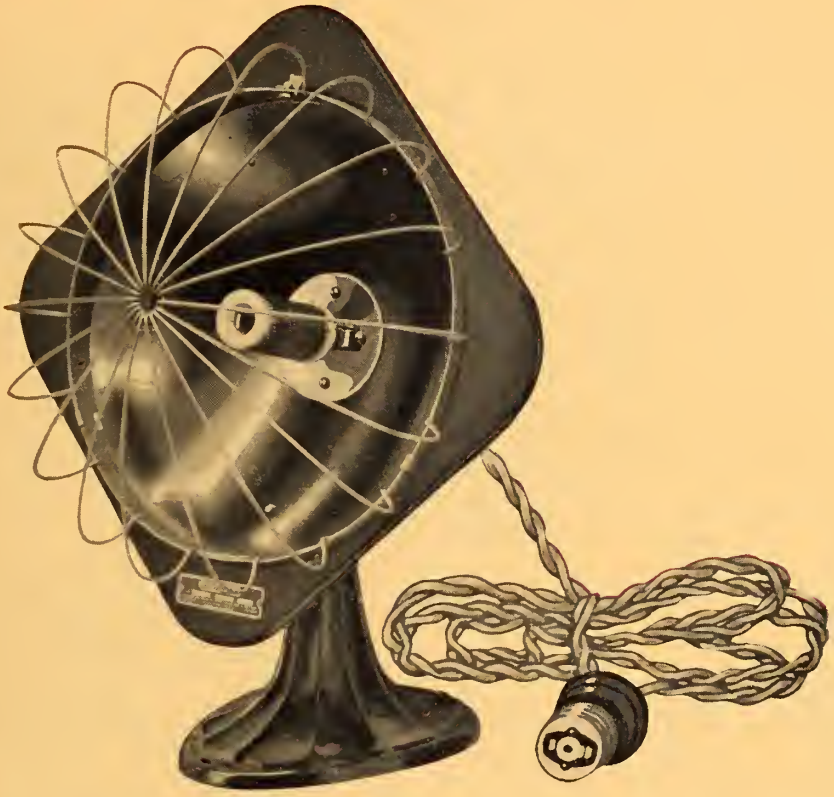
"Made in Canada" by

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited

Hotpoint





HEDLITE HEATER

"Warms as the sun warms"

The season for this appliance is fast approaching. The first cool fall evenings will be the signal for a large demand for Hotpoint Hedlite Heaters.

Dealers, who have their stock of Hedlite Heaters ready, will naturally benefit most by this demand. We can make immediate shipments from stock, and would strongly recommend that you place your order early as invariably a shortage of heaters is witnessed at the time when a supply is most needed. Your jobber or our nearest Sales Branch can supply you.

"Made in Canada" by

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited





$1.75
List Price

Every Lamp Socket An Aerial With the DUCON---no outside wires necessary

THE Ducon allows a radio receiving set to be connected to any electric light socket, wherever that socket may be. It is simply screwed in like an electric lamp. Although it is connected with the lighting circuit, the Ducon can be handled without shock. It is electrically dead. Its terminals may be connected by a wire without the slightest danger.

Practically every electric light wire that enters a house is an ideal aerial. By using the wiring installation of the average house, by means of the Ducon, a large aerial is at once available.

The demand for this wonderful little device will, in all probability, exceed the supply. We strongly urge all Electrical Dealers, who are merchandising radio equipment, to place their orders with our nearest sales branch immediately.

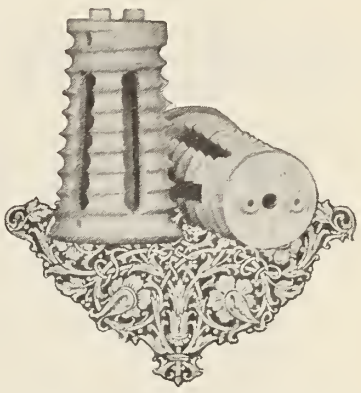
"Made in Canada"

Canadian General Electric Co., Limited

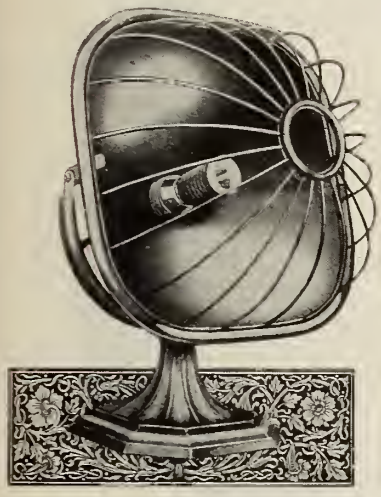
HEAD OFFICE TORONTO

Branch Offices: Halifax, Sydney, St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

L&H REFLECTOR HEATERS use ELEMITE



DOUBTLESS the outstanding reason for the marked success of the L & H Reflector Heater is its dependable heating element. The reputation of A. J. Lindeman & Hoverson Co. of Milwaukee, prominent manufacturers of Stoves, Ranges and Sheet Metal Ware since 1890, demands "quality materials" throughout. Significant verification of the rigid R & L policy will be found in the fact that heating units of all R & L Reflector Heaters are based on ELEMITE porcelain cores



ELEMITE FOR LONG SERVICE

ELEMITE is the one dependable porcelain structure suitable for use in the heating element of Quality electrical appliances. It is Flexible. Will expand and contract with temperature changes, without cracking. Will pass the most severe temperature test ever imposed on porcelain. Elemite is produced in special shapes to the exact specification of customer.

Send sketch or model for cost estimates.
Write for samples for testing

THE LOUTHAN MANUFACTURING CO.
EAST LIVERPOOL, OHIO
FACTORIES
EAST LIVERPOOL, O. LAUGHLIN, O.

Moloney Transformers



Distinguished for their superior performance, economy and reliability

Designed for greater efficiency, and constructed of the finest materials by experts in their line, Moloney Transformers are acknowledged leaders. Moreover they are entirely Canadian built.

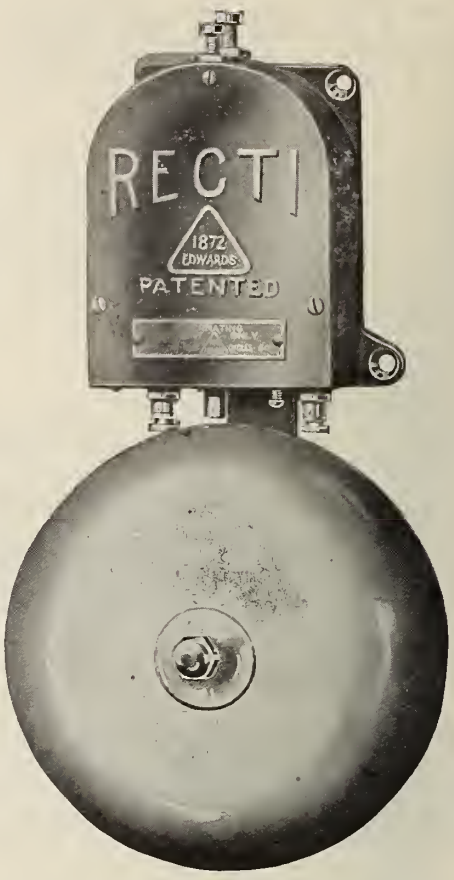
We can make prompt delivery on Service Type Transformers from stock.

Write for descriptive bulletins and prices. You will want to keep them on file.



MOLONEY ELECTRIC COMPANY OF CANADA, LTD.
Factory and Head Office: 213-219 Sterling Rd., Toronto, Ont.
Branch Offices: Montreal, Halifax, Winnipeg
Agents: General Supplies Co., Calgary, Alta. Frank Darling, Vancouver and Victoria, B.C.

EDWARDS RECTI BELL



DO YOU WANT SERVICE?—Then let us tell you that there are countless Edwards "RECTI" Bells in use today which were installed 28 to 30 years ago. During all of this time, these bells have been exposed to the most severe and trying weather conditions and yet have continued to give uninterrupted and absolutely dependable service.

This Bell is no experiment and in its present form is the result of 50 years of Bell Building Experience.

The hammer rod is of brass and cannot jolt out of adjustment. The springs are made of the highest grade phosphor-bronze. The contacts are carbon, made of heavy headlight rod which will not oxidize, stick or corrode. Made for all uses and voltages.



No. 720
2½" IRON BOX BELL

Has by far the largest sale of any house bell. Extra heavy interrupting post makes adjusting unnecessary.



No. 510
TRANSFORMER BELL

Has heavy carbon contacts which cannot stick, oxidize or corrode. It strikes a powerful blow and gives maximum sound.



No. 17
ECONOMY BELL

Equipped with the famous "Vibrating Reed" armature that gives a very heavy stroke on less battery.

1872 EDWARDS

EDWARDS and COMPANY INC.

1872 EDWARDS

602 Avenue Block
Winnipeg

3 St. Nicholas Street
Montreal

220 King St. West
Toronto

The Star Porcelain Company

TRENTON, N. J.
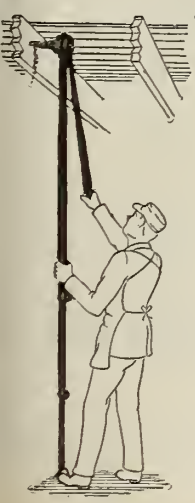
Manufacturers of Electrical Porcelain Specialties. Also specialize in the manufacture of heater bricks for electric ranges.

CANADIAN PORCELAIN CO.

LIMITED

HAMILTON - CANADA

Manufacturers of High and Low Tension Porcelain Insulators



Kyle Boring Machine

Bores holes at any angle.
Adjustable 4½ to 13½ feet.
Price $29.00

One Montreal Dealer says:
"Just the machine I wanted."

Another Dealer says:
"Saved the price of two machines on one job."

Distributors wanted.

Ren Automotive Supply Co. Ltd.
Preston, Ontario

International Business Machines Company

LIMITED

300 Campbell Ave., Toronto

Manufacturers of International Electric Time Systems, comprising Master Clocks, Secondary Wall Clocks, Bell-ringing Programme Devices and Automatic Charging Cabinets.

Complete Electric Time Systems for Schools, Colleges, Public Institutions, Office Buildings, Factories, etc.

To The Trade:

Re 660 Watt Pull-Chain Sockets.

Gentlemen:-

Owing to the fact that at the time the 660 watt socket ruling was put into effect it was difficult to obtain 660 watt sockets of the pull-chain type, therefore it was necessary for us, in many cases, to make exception to this rule and permit the use of 250 watt pull-chain sockets.

We have, however, recently been informed that the socket manufacturers of Canada are now prepared to supply the demand and fill all orders for 660 watt pull-chain sockets of an approved type.

You will, therefore, kindly take notice that after September 15th, next, the 660 watt socket ruling will be rigidly enforced and sockets of any type of a lower rating than 660 watts will not be accepted for installation in the Province of Ontario.

Yours very truly,

A. G. HALL,

Chief Electrical Inspector
Hydro-Electric Power Commission of Ontario.

Sepco AUTOMATIC ELECTRIC

A New Hot Water Service

It sets a new standard for Low Price and Operating Economy

No home may be considered modern today without the convenience of having ready automatic hot water service. Without it the bathroom, the kitchen sink, and the laundry tubs stand in mute mockery of their intended usefulness. Its value to clean, comfortable living cannot be overestimated. The new Sepco Automatic Electric is the first to offer this service at a low operating cost. It gives you all the hot water you need, full pressure at all faucets, and is entirely automatic. It is installed on the side of the ordinary range boiler in exactly the same manner as any other electric or gas water heater.

Mr. Electrical Dealer—write us for prices and further particulars. It means money in your pocket.

—MADE-IN-CANADA—

SEPCO AUTOMATIC ELECTRIC HEATERS, LIMITED

47 Richmond St. East, Toronto

Where We Stand
On the Use of Trade Papers

The very first advertisement we placed when we started sixteen years ago was in a building trade paper.

It gave us no trade discount.

But it was a paying investment for our advertiser.

So they in turn paid us for having made it pay them.

As making advertising pay is what we are paid for, we use trade papers when it pays to use them.

Regrettably, some advertisers still cling to the idea that "trade papers are hold ups."

The most cursory investigation will prove them to be among to-day's most powerful business-building influences.

Sixteen years ago it proved basically sound to start our advertisers in trade papers.

It's even more sound practice to-day, whether you want to reach the architect, the hardware man, the electrical dealer or what not.

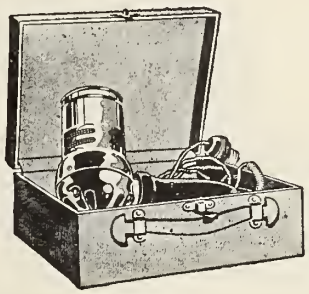
Let us start at the bottom with the trade papers and upbuild your business by their use.

Tuthill Advertising Agency

L. W. C. Tuthill, President
1133 BROADWAY
NEW YORK

STAR-Rite

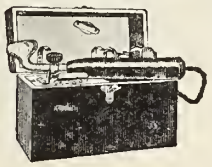
ELECTRICAL NECESSITIES



HAIR DRYER
Universal Motor
Aluminum Construction
Retails . . . $17.50



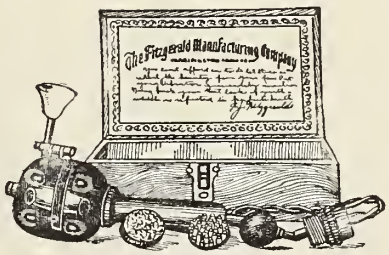
Handsome All Nickeled
WAFFLE IRON
With separate tray
Retails $12 00



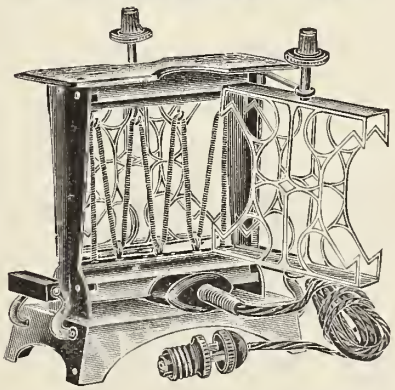
VIOLET RAY
Cabinet Size
Retails $17 50



All Nickeled
SEWING MOTOR
With fool-proof any speed foot rheostat.
Retails $18.50
Buffer or Grinder . each .75



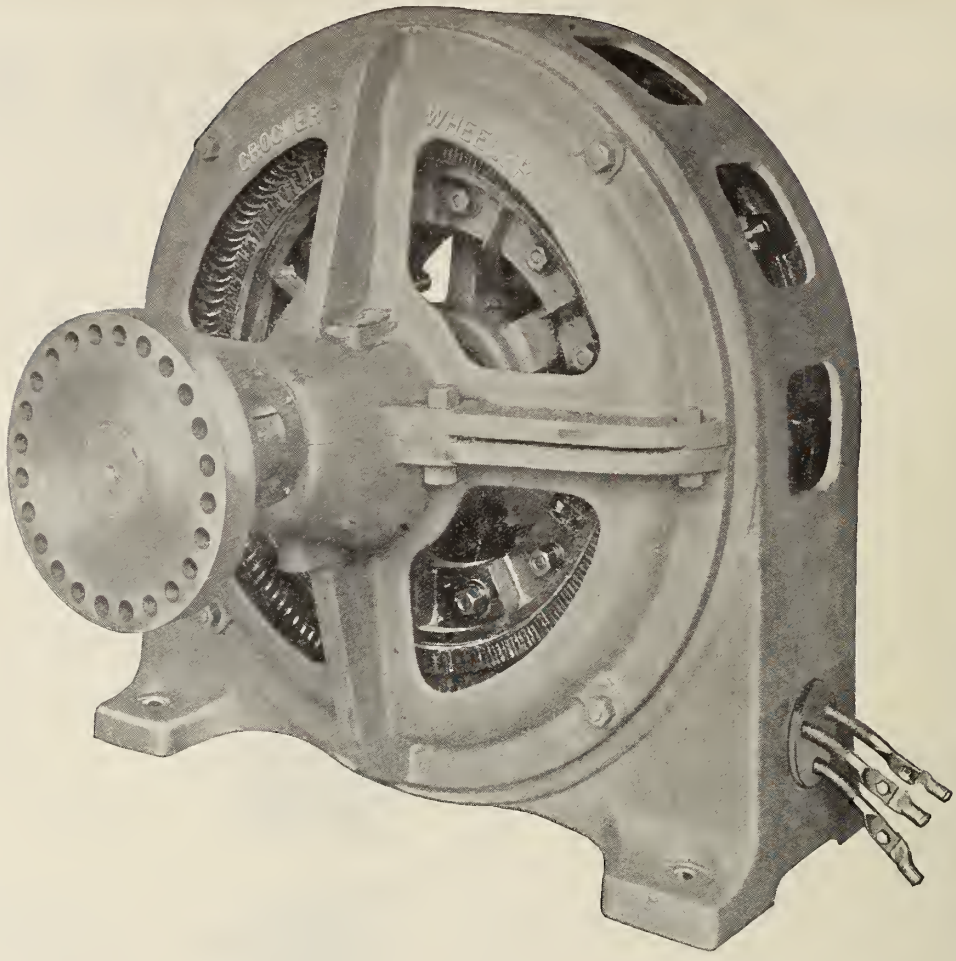
MOTOR VIBRATOR
complete with applicators.
Retails $17.50



REVERSIBLE TOASTER
New improved model
Retails $6.75
West of Ontario $7.00

Order from your jobber or write us.

Canadian Fitzgerald Mfg. Co.
95 King St. E. - TORONTO



FOR THE VERY EXACTING DUTIES OF MINE HOISTING AND HAULAGE

We have developed a motor that is giving excellent service in the gruelling work incident to mine work. The Wound Rotor is of special Canadian Crocker-Wheeler design, coils are form wound, the insulation is particularly thorough against moisture and acids, the end housings are split for accessibility —a motor as near fool proof and accident proof as can be built.

THE CANADIAN
CROCKER-WHEELER CO.
LIMITED

Manufacturers and Electrical Engineers

Head Office and Works:
ST. CATHARINES. Ont.

District Offices:
TORONTO MONTREAL

Also all Branches of

Northern Electric Company
LIMITED

Montreal, Halifax, Quebec, Toronto, Hamilton, London, Windsor, Winnipeg, Regina, Calgary, Edmonton, Vancouver,

"Reel Service"

From Coast to Coast

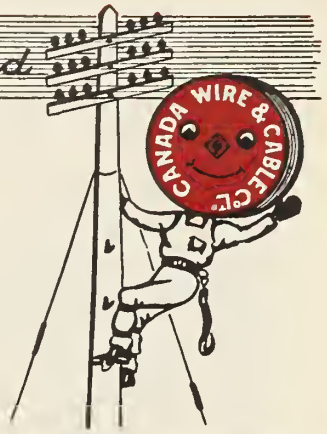
Canada Wire & Cable Co. Limited

Halifax Montreal Toronto Regina
Winnipeg Calgary Vancouver

MANUFACTURERS OF
Copper
Bare, Weatherproof, Rubber Covered

Electrical Wires and Cables

and STEEL WIRE ROPE



FUSES

are good until used

U-RE-LITE

CIRCUIT BREAKERS

are good not only
"until used" but

FOREVER AFTER

They mean better protection for your men and machines

Send for Details

The CUTTER COMPANY
ESTABLISHED 1888 PHILADELPHIA

24 Adelaide St., E., TORONTO

Interior Telephones

for

Apartment House, Factory, School, Hospital, Office

Electric Reset Annunciators and Signal Specialties

Hospital Signal System

A complete new silent call system for hospitals. Registers at nurses' quarters and office with time record, if wanted.

Canadian Factory Representatives:

Cochrane, Stephenson & Co. Ltd.
850 Hastings St.
Winnipeg, Man.

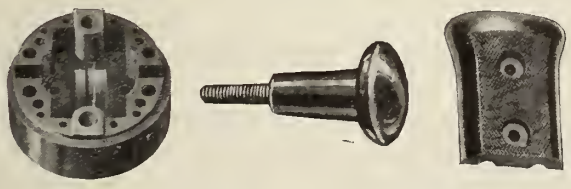
Cochrane, Stephenson & Co. Ltd.,
901 Credit Foncier Bldg.,
Vancouver, B.C.

Timberlake & Bourne
New Birks Bldg.,
Montreal, Quebec

The Pierce Electric Company,
104 Richmond St. West,
Toronto, Ontario

CONNECTICUT TELEPHONE & ELECTRIC COMPANY
MERIDEN CONNECTICUT

Cold Molded Insulating Part



AMERICAN INSULATOR CORPORATION
New Freedom, Pa., U.S.A.
Represented in Canada by
G. L. MacGILLIVRAY & CO., LIMITED
3 St. Nicholas St., Montreal, P.Q.

MICA

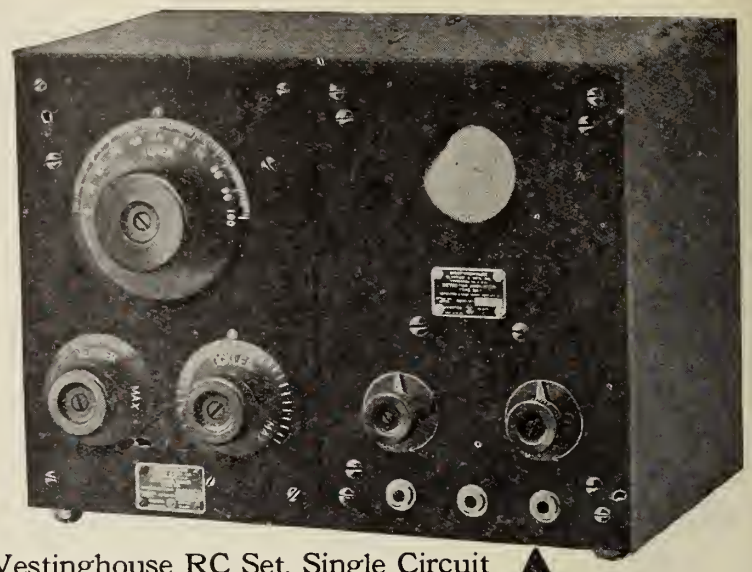
KENT BROTHERS

Kingston, Ont., Canada

Miners, Exporters and Dealers in Canadian Amber Mica.
Thumb Trimmed, Cut to Size, Splittings, Discs, Washers, Etc.

Write us for prices and let us figure on your requirements.

Prepare For A Radio Winter



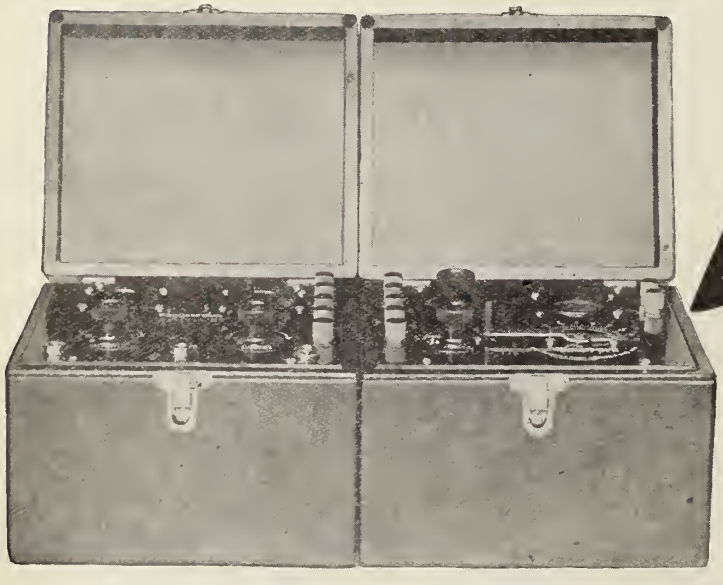
Westinghouse RC Set, Single Circuit Regenerative Tuner, Detector and Two-Stages of Amplification.

"Excels in Efficiency"

Now is the time to prepare to cash in by selling good radio outfits next Fall and Winter.

Broadcast programs in Canada and the United States are getting better and better. Radio is passing out of the infant stage and offers excellent entertainment for indoor evenings.

CANADIAN WESTINGHOUSE



Westinghouse Senior Regenerative Tuner, Detector and Two-Stages of Amplification.

Westinghouse Radio Receiving Sets were developed by expert Radio engineers and are the latest word in efficiency.

Canadian Westinghouse Co., Ltd.

Hamilton - Ontario

TORONTO, Bank of Hamilton Bldg.
HALIFAX, 105 Hollis St.
CALGARY, Canada Life Bldg.
MONTREAL, 285 Beaver Hall Hill
FT. WILLIAM, Cuthbertson Block
VANCOUVER, Bank of Ottawa Bldg.
OTTAWA, Ahearn & Soper, Ltd.
WINNIPEG, 158 Portage Ave. E.
EDMONTON, 211 McLeod Bldg.

Repair Shops:

TORONTO—366 Adelaide W.
VANCOUVER—1090 Mainland St.
CALGARY—320 8th Ave. W.
MONTREAL—113 Dagenais St.
WINNIPEG—158 Portage Ave.



STATE RAILWAYS OF CHILE

Newly Completed Electrification on Main Line from Santiago to Valparaiso

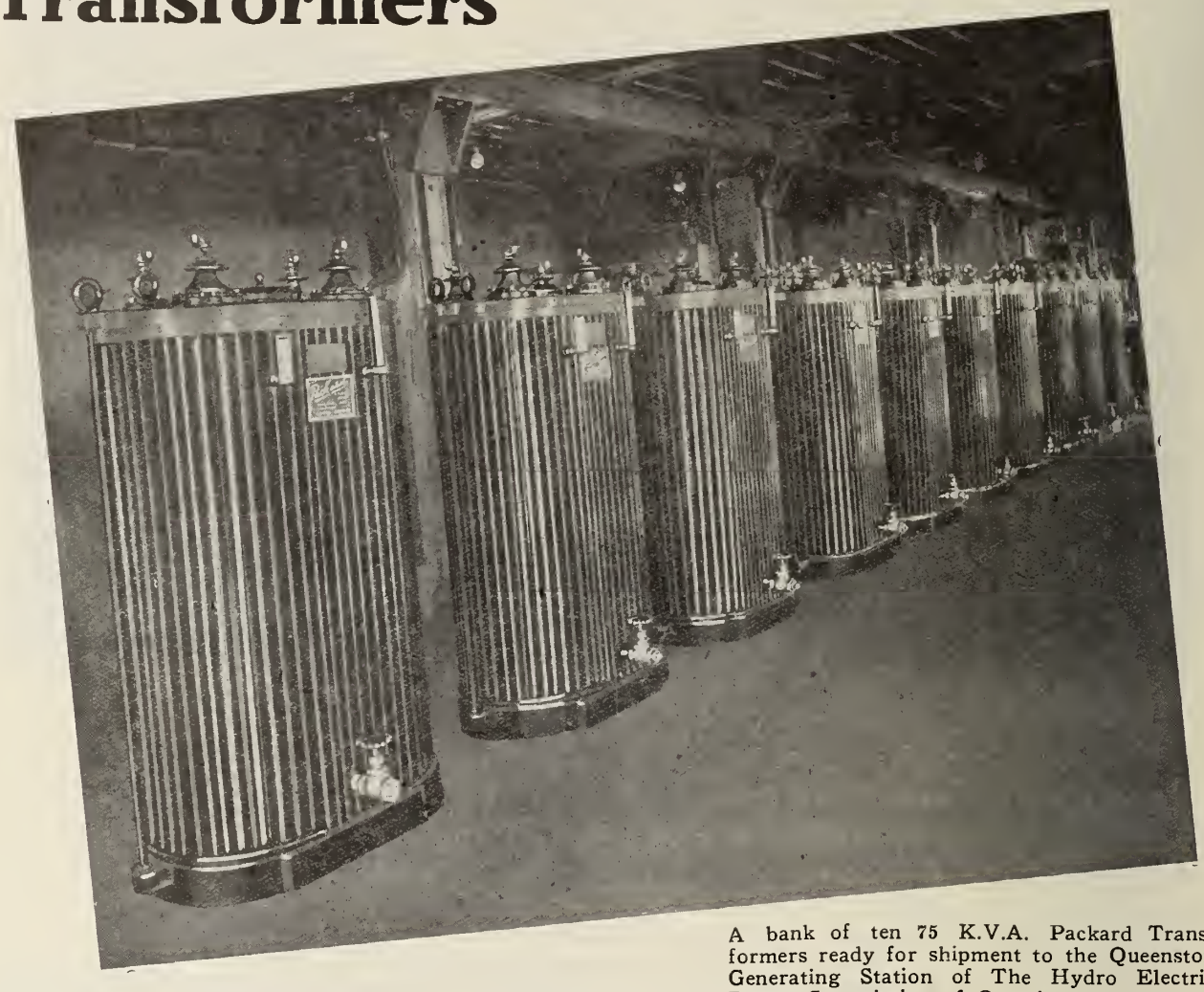
The illustration shows, on the right hand half of the crossarm, the 795,000 circular mil All Aluminum Feeder Cable. On the bracket above, 3/0 A.W.G. All Aluminum Negative Feed. On the left-hand half of the crossarm, No. 4 A.W.G Aluminum Cable Steel Reinforced P.I.L. circuit.

An ideal service for ALUMINUM CABLE is found in its use as direct current feeder, particularly in the fume-laden atmosphere which must be considered on a combined steam and electric railroad.

NORTHERN ALUMINUM COMPANY, LTD.

1307-09 BANK OF HAMILTON BUILDING
TORONTO, ONT.

The Hydro Commission Chooses Packard Transformers



A bank of ten 75 K.V.A. Packard Transformers ready for shipment to the Queenston Generating Station of The Hydro Electric Power Commission of Ontario.

Packard

TRANSFORMERS

The Packard Electric Co., Limited

St. Catharines, Ontario

Room 308-9, 7 Adelaide St. W., Toronto **421 Power Building, Montreal**

703 Confederation Life Building, Winnipeg

Agents:

H. M. Hopper, 57 - 59 Dock St., St. John, N. B. J. T. Warren, 738-11th St. West, Calgary, Alta.

Scott Foster & Co., 615 Hastings St. West, Vancouver, B.C.

John Starr, Son & Co. Limited, Halifax, N.S.



5 Years From To-day

Will you be recognized as a successful Electrical Dealer with a good credit rating? Will you have a reputation in your community as a leading business man? Will you be in a position to spend the Winter in some southern clime without endangering your financial position? Men in other lines of business accomplish this. Why not an Electrical dealer?

It rests with you

The Electrical business is the fastest growing of all businesses to-day. It offers the greatest opportunity to build up a sound substantial business yet not 5% of those engaged in it to-day are making a success of it. Why? Mainly because they are not giving enough attention to the dollars and cents side of their business. They are too eager to get work away from their competitor with little regard for such important matters as overhead expense and correct selling prices.

We guarantee your profits

The Henderson Business Service Limited is doing more for the Electrical trade than all other things combined It is assuring the dealer of a reasonable profit. It is saving his time. It is encouraging him to adopt businesslike methods and the cost of the service (at 10 cents per day) is so low that no dealer can afford to be without it.

Get Full Particulars Today →

Henderson Business Service Ltd.
Farmers Building
Brantford

P.O. Box 123

Henderson Business Service Ltd., Box 123, Brantford, Ont.

Send us full particulars of your service

Name .....

Address .....



"Yes, Mr. Watson, I know your firm and I'm glad to meet you!"

Then the man behind the desk told **why** he knew Watson's firm, and why he was pleased to welcome its representative.

He said that he was a regular reader of CONTRACT RECORD; that, in fact, it was essential to him in his business, and that he had also been reading the advertising of Watson's line in the same paper.

He had, it is true, never ordered any of the product from the advertiser—he knew that sooner or later a salesman would call and tell him more about the line and its adaptability to his particular business.

And the salesman, now that he had called, found the ground prepared for him. The prospective customer had already formed a favorable impression of the firm and its product and it only remained for the personal presentation to make the sale.



Every Week to 4,000 Real Buyers

More important still, it paved the way for future sales.

That is just what advertising in CONTRACT RECORD does in scores of cases where the advertiser is not aware of the processes through which the successful contact has been established.

Advertising in a publication like CONTRACT RECORD—the accepted leader in its field—has as its chief function, the education of the reader to the particular merits of the products or service advertised, and the building of prestige for the advertiser.

The constant, periodical association of a firm and its product or service with the important educational and practical editorial contents of the paper—respected as few papers of its kind are by its readers—has as its inevitable result the establishment of a feeling of friendliness for the advertiser.

Advertiser's Representatives find Work Easier and Sales Greater

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349 West Adelaide Street, Toronto

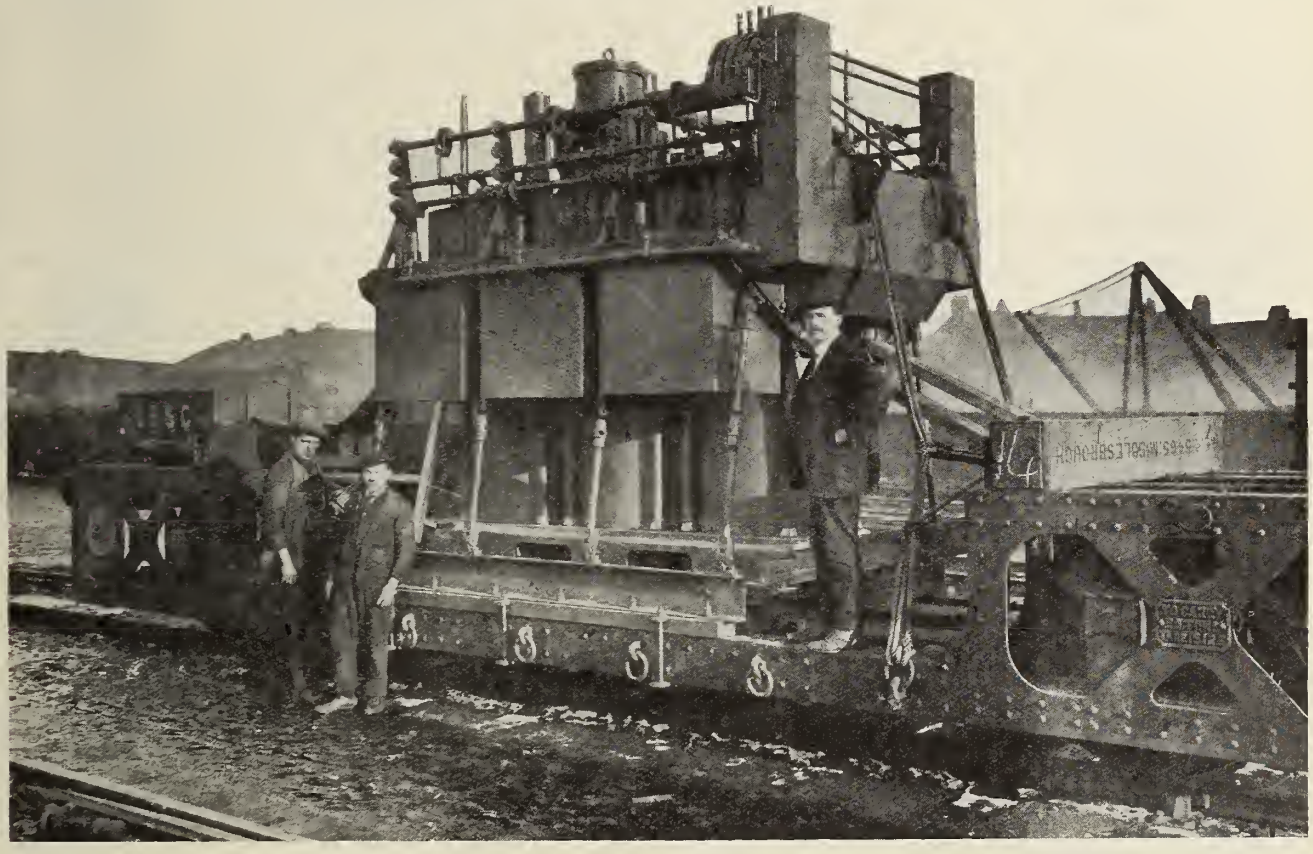
FOR
SOUND SAFE SWITCHGEAR
THE BEST PROPOSITION
IS
REYROLLE ARMOURED SWITCHGEAR

The photograph illustrates a Reyrolle 6,600 volt, 2,500 ampere Circuit Breaker, en route to Kilmarnock Super Power Station, (Glasgow).

These Breakers are simple, strong and safe in every detail—the qualities requisite for the successful running of a Power Station.

The total enclosure of all live parts, together with a simple but effective locking gear, ensures accessibility with safety.

Complete panels may be furnished to meet a wide range of power station requirements. When selecting new switching equipment, do not overlook the advantages offered by Reyrolle Armoured Gear.



Send your enquiries to

A. REYROLLE & Co LTD.

HEBBURN ON TYNE, ENGLAND.

FEDCO



This trademark, in all that pertains to **Electrical Porcelain**, is the Badge of Quality, the Symbol of Service, and the Pledge of Square Dealing.

The Federal Porcelain Company

Factory :
CAREY, - OHIO

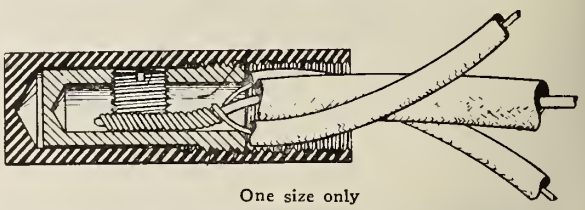
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Dominion Engineering Agency, Limited
24 Adelaide St. E., Toronto

I. W. Levine,
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Takes any fixture condition
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Underwriters Laboratory Approval No. 6038
EVERY CONNECTOR FULLY GUARANTEED

All danger from soldering entirely removed

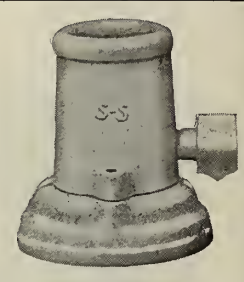
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We are now completely equipped, by the addition of three new kilns, to supply the electrical trade with the highest grade

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We guarantee the utmost care in packing and quick action on all orders.

Service and Satisfaction is our Motto

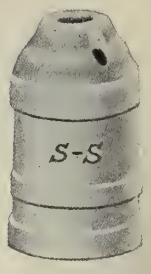
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Electrical Manufacturers

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Representatives:
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Only one adjustment

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KLITZEN RADIO MFG. CO , Inc.
Racine, Wis.



MODEL No. 525 LIST PRICE **$80.00**

"UNITED" Service

To Our Dealers Better Than Ever

We have moved into our new million-dollar plant, with nearly twelve acres of floor space; and a splendid precision tool equipment.

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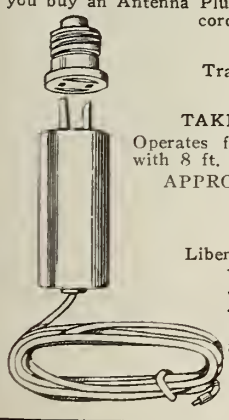
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Ask for FERRY in your new apparatus. Insist on it for rewinds and renewals.

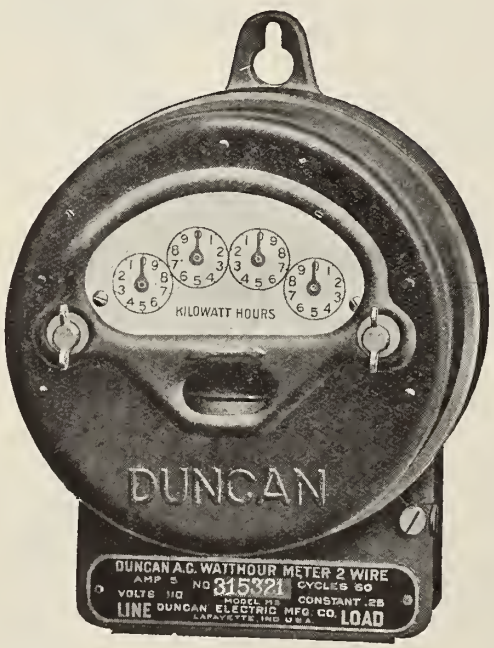
Every Mining Electrical Engineer is, from time to time confronted with the renewal of the Resistance Material—Coil or Ribbon—in his Starters and Controllers.

He should remember that FERRY Resistance Wire has given TWENTY Years satisfactory service in every class of Motor Starter and Controller.

It is British made and is specified by the Admiralty.

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Watthour Meters

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Through Years of Service

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10 Miles
3 Conductor 250,000 C. M.
Paper Insulated Lead Covered Cable
13,500 Volts Working Pressure

Manufactured For

City of Winnipeg Hydro Electric System

To Their Specifications

Insulation	.43 inches
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Approximate Weight Per Foot	11.1 lbs.

Northern Electric Company
LIMITED

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HALIFAX HAMILTON WINNIPEG EDMONTON
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"Makers of the Nation's Telephones"

MANUFACTURING
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Wires & Cables
Fire Alarm Systems
Radio Sending and receiving Equipment

DISTRIBUTING
Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
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The Peanut Tube Has Made Many A Set Perfect



R 215A Peanut Tube

A heavy demand for this radio essential is foreseen from reports of the number of people building their own sets.

For bringing in distant stations it has no equal.



R40 SOCKET

DEMAND YOUR SUPPLY
AND
SUPPLY YOUR DEMAND

Northern Electric Company
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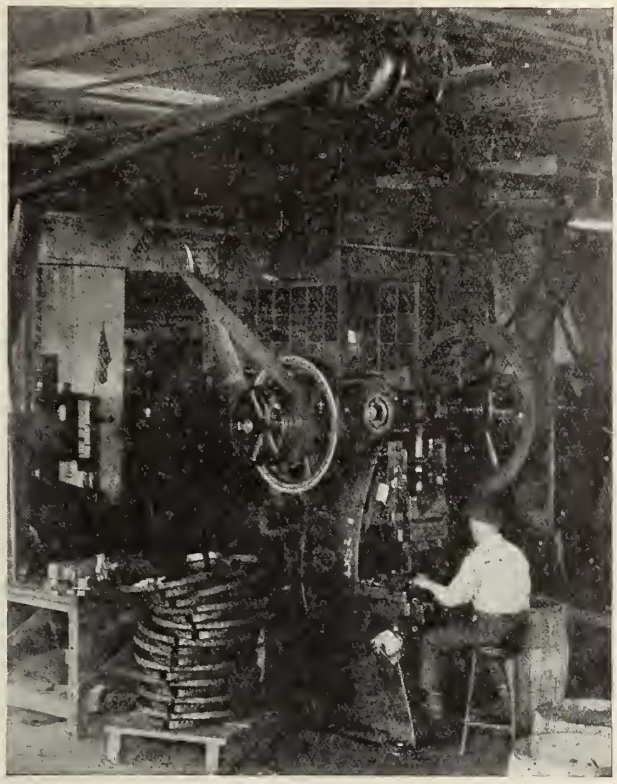
MONTREAL TORONTO WINDSOR CALGARY
HALIFAX HAMILTON WINNIPEG EDMONTON
QUEBEC LONDON REGINA VANCOUVER

"Makers of the Nation's Telephones"

MANUFACTURING
Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and receiving Equipment

DISTRIBUTING
Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

Dealers apply to nearest branch house for prices and discounts



Illustrated is a 15 H.P. Polyphase R & M Motor driving four Bliss punch presses, a power roll and circular shearer.

TROLLEYS—AND R & M MOTORS

The Electric Service Supplies Co., Philadelphia, manufacture supplies for street cars, railway cars and make other allied equipment. Their manufacturing processes are, indeed, many, but R & M Motors furnish the motive power for most of the plant drives.

The motor illustrated above is subject to the varying loads of four punch presses, a power roll, and a circular shearer which help in the making of trolley car gear cases, yet without any interruption it has done its heavy work for four years.

Fifteen other R & M Motors of various sizes are serving in this plant. And in the words of Mr. Paul Campbell, Factory Manager, "Their service has been excellent." Dealers handling R & M Motors find such testimonials as Mr. Campbell's of inestimable value in selling other plant managers needing motor equipment.

Contractors and dealers will do well to investigate the R & M proposition. Write us today.

R & M Motors are made in sizes from 1/50 to 150 H. P.

The Robbins & Myers Company of Canada, Limited

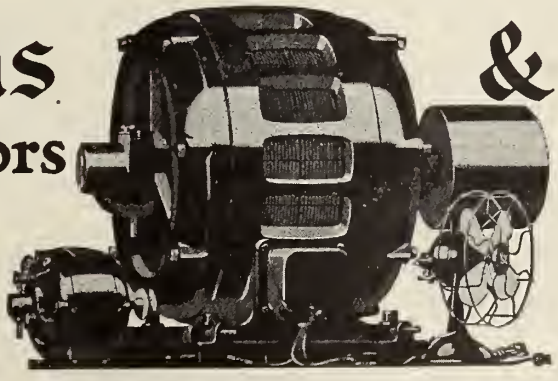
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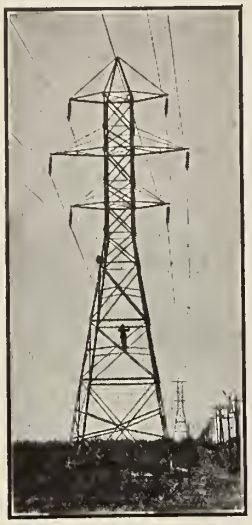
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Motors *and Fans*



GALVANIZED STEEL TOWERS AND POLES



Standard Tower Hydro
Electric Power Commission of Ontario

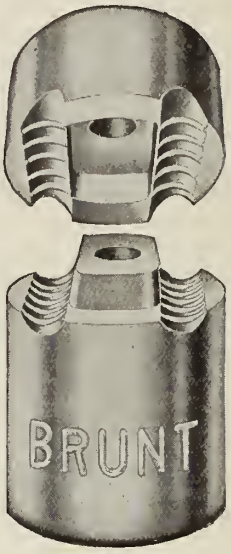
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Power
Telephone
and
Trolley
Lines

We shall be pleased to furnish designs and estimates upon request.

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Structural Steel of all Kinds
Montreal Office in New Birks Building.

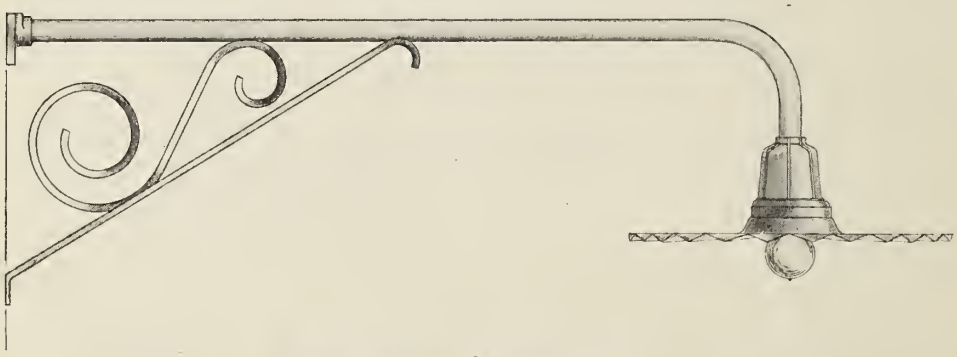
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PORCELAIN
KNOBS
TUBES
CLEATS
AND
SPECIALTIES

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Multiple Unit Cat. No. 100513

OUTSTANDING FEATURES

1. Strong pipe bracket, angle iron scroll and brace, solid welds, no screws.
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3. Cast iron canopy and adjustable socket.
4. Supplied with globe, refractor, or reflector: Perfect interchangeability.

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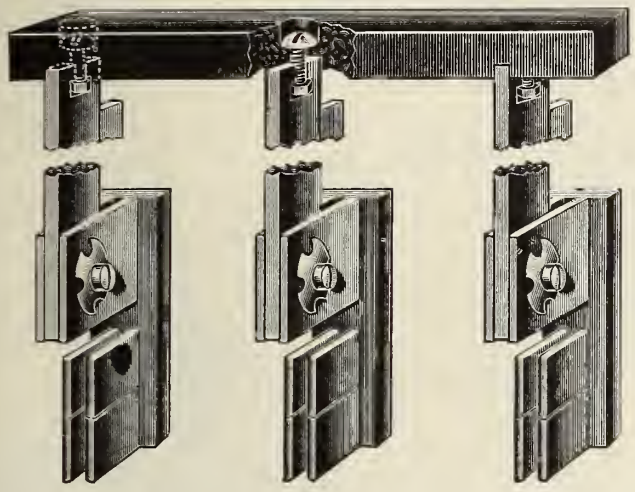
WINTER JOYNER
Company Limited

445 King St. W.
TORONTO

Just some of the reasons why we use

Benjamin Knife Switches in Our Service Boxes.

Knife Blade Connecting Bars



BENJAMIN KNIFE SWITCHES are all equipped with a KNIFE BLADE CONNECTING BAR which possesses features far superior to those found in the average KNIFE SWITCH for SERVICE BOX use.

BENJAMIN CONNECTING BARS ARE STRONG BOTH MECHANICALLY and ELECTRICALLY, a characteristic of all BENJAMIN PRODUCTS.

In BENJAMIN KNIFE SWITCHES for SERVICE BOX USE of 30 to 60 AMPERE capacity the KNIFE BLADES of the "turn-over" type are firmly fastened to the "CHUNKEY" BENJAMIN CONNECTING BAR with large sized machine screws, (DIRECT to BLADE, not to SEPARATE PIECES FASTENED TO THE BLADE.)

In SWITCHES for SERVICE BOX use of 100 AMPERE capacity and over the KNIFE BLADES are sunk in deep slots in the "CROSSBAR" and each is held in place with a large screw and large nut.

These two types of construction make it almost impossible for the KNIFE BLADES to get out of ALIGNMENT with those BENJAMIN CONTACT JAWS you read about in the last issue.

There is no possibility of a BENJAMIN CONNECTING BAR twisting.

There are no flimsy connecting links to become loose on a BENJAMIN CONNECTING BAR.

There are no thin pieces of TUBING, insulating BENJAMIN KNIFE BLADES from STEEL CONNECTING BAR.

BENJAMIN CONNECTING BARS are made of SOLID SHEET FIBRE.

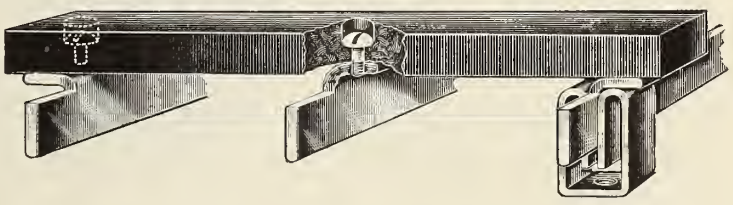
BENJAMIN KNIFE BLADES enter BENJAMIN BREAK JAWS SMOOTHLY time after time, because they are fastened to BENJAMIN CONNECTING BARS.

Switch Mounting Bases

Every BENJAMIN SWITCH MOUNTING BASE is made of first grade Electrical Slate.

Every BENJAMIN SWITCH MOUNTING BASE is tested for Metallic Veins.

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Every BENJAMIN SWITCH MOUNTING BASE is of such generous size that ample clearance is given between grounded parts and line metal parts.

The Single BENJAMIN SWITCH MOUNTING BASE insures you against loose contact jaws—there are not a MILLION parts to become loose.

Think of these few points and see that "CANADIAN DRILL" SERVICE BOXES are used in your next installation.

Use "Canadian Made" Not "Canadian Assembled"—"Keep Your Money in Canada"

Canadian Drill & Electric Box Co., Limited

1402 Queen St. East, Toronto, Ontario

Phone Gerrard 0554

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Supplied in Cased-Glass

	Diam.	Depth	Fitter
No. 1060 —	10″		6″
No. 1061 —	13″		6″
No. 1062 —	16″		6″
No. 1063 —	18″	10″	8″

Jefferson
MADE IN CANADA

LIGHTING UNITS

FOR EVERY REQUIREMENT

396 Series



Supplied in Moonstone R. I. or Cased-Glass

	Diam.	Depth	Fitter
No. 396 —	16″	10″	6″
No. 397 —	10″	10½″	6″
No. 398 —	12″	14″	6″

555 Series



Supplied in Cased-Glass, Sol-Lux, or etched design 167—Sepia

	Diam.	Depth	Fitter
No. 555 —	15¾″	8″	6″
No. 556 —	13″	8″	6″
No. 557 —	10″	8″	6″

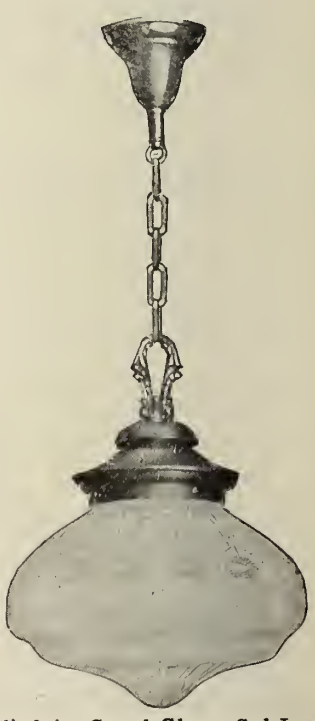
550 Series



Crystal Enamelled

	Diam.	Depth	Fitter
No. 550 —	13″	8½″	6″
No. 551 —	15⅞″	11½″	6″

515 Series



Supplied in Cased-Glass, Sol-Lux, or etched design 166, as illustrated

	Diam.	Depth	Fitter
No. 515 —	10″	9¼″	6″
No. 516 —	14″	10″	6″
No. 517 —	12″	14″	6″

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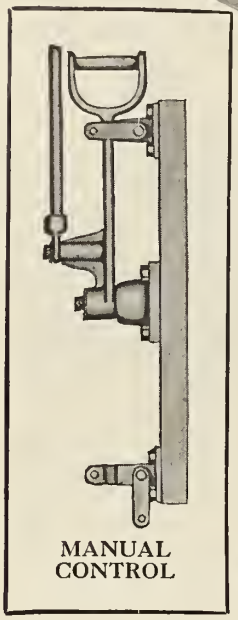
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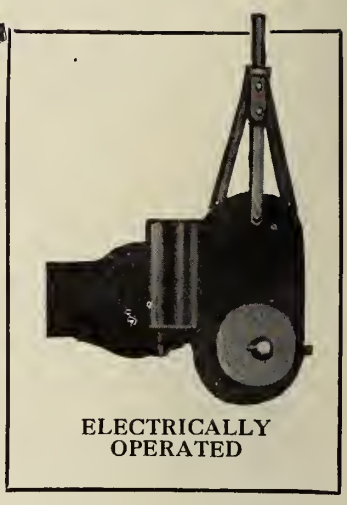
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Air Break Switches Up to 132,000 Volts

In many cases Elpeco Air Break Switches can be substituted for the more expensive oil switch, and can be depended upon to interrupt large currents, under all weather conditions. Tests have proved this.

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Will you let our engineers show you the construction details of this apparatus?

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ELPEC

ELECTRIC POWER EQUIPMENT CORPORATION

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Boosting the Floor Lamp

Giving an Attractive Atmosphere to a Store—What Women Like—How to Dress a Window With Floor Lamps and Portables

Electricity is hustling the coal-oil lamp and the sad-iron into oblivion. With them goes the "Bargain Price" idea of selling electrical goods, and there has been a corresponding change in the appearance of our places of business. From a mere shack where a struggling wiring and repair business is carried on, to a tastefully decorated store, noted for its appearance and the quality of its merchandise, is a story that is being enacted to-day.

It will be found that the electrical dealer who has got so far as to build up a reputation, always has a nice looking store and invariably he has floor and portable lamps on display, knowing what an extra touch they give to the other fixtures.

Scared of a Dungeon

A manufacturer of such artistic adjuncts, a woman, tells a story about entering a large electric store in Eastern Canada. Her first impression was of the extreme gloom that prevailed in the store, beginning just back of the front windows. The salesman—who was also the owner—advanced to meet her and involuntarily she exclaimed, "My! what a dungeon of a store you have!" The owner gasped, but on recovering his breath, asked, "Is that how it strikes you?" "Yes," she replied, "and if I had been a prospective customer instead of a saleswoman, the first thing I should have done would be to turn and run away." Mr. Dealer pondered that a moment and finally admitted that he had seen customers turn away for no apparent reason.

Now this gentleman had been endeavoring to sell electric washing machines, ironers, ranges and vacuum cleaners, and he displayed

them just about as artistically as a machine agent does his gas engines and concrete mixers. It had never occurred to him that he could use a rug or two, a few easy chairs and some pretty lamps in such a way as to give his store an inviting appearance.

She Converted Him

However, the lamp saleswoman completely converted him. It is true she benefited herself by the sale of a few lamps, but at the same time she gave him gratis some valuable hints on store arrangement. The word "dungeon" has no application to that store now.

The immense display shown in Fig. 1 is not printed as a pattern for any dealer to strive for, but it shows the gorgeous effect that a number of lamps produce. This photograph was taken in the furniture section of a big department store, but it would seem that the furniture is almost lost sight of. The display is undoubtedly attractive to the eye and it shows how effectively the lamps line up with household articles.

How to Use Them in the Window

Sometimes a dealer wants to use portable lamps in his window, and is a bit puzzled about how to arrange them. The general tendency is to make the trim too square and symmetrical, one in each corner, and a dot in the centre, so to speak. Fig. 2 shows an example of artistic grouping, just the reverse of this too-severe symmetry. There are no two pieces of exactly the same kind in the window, but the net result is harmonious, an effect secured largely by the effective use of small art objects. This window appeared in the Toronto store of McDonald & Willson.

Dealers who have artistically inclined wives will not find any great trouble in selecting floor lamps, if they let their wives do the picking. This little tip was given to Electrical News by George Barclay. His window and store interior always look "dandy" and he gives the credit to Mrs. Barclay for supplying the ideas.

For One Kilowatt Hour

Would you be willing to carry 5400 5-gallon cans full of water up a ladder 16½ feet high every hour for three cents an hour? You would not, nor would anybody else in this country. Yet that is what is necessary to generate one kilowatt per hour. Did you ever try to explain it to a disgruntled consumer in that way?

Electricity in Coke Plants

Westinghouse Electric & Manufacturing Company has issued Leaflet 1867, which describes electrical equipment for coke plant machinery. Illustrations of the uses of electricity in by-product plants are shown with recommendations as to the various types to be used.



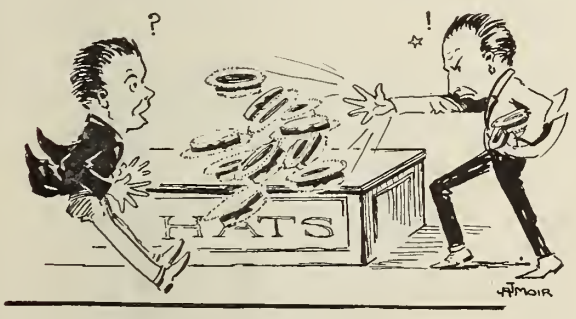
An attractive little window of lighting materials. Note the use of velvet hangings, and an opaque background. No duplication, no overcrowding, and yet symmetry is achieved.

Doesn't It Happen Every Day?

Six Little Real-Life Anecdotes Showing Why Some Customers Bought and Some Didn't—The Lessons Taught are Applicable to Electrical Stores—They are Actual Experiences

A Retailer's Experience as a Customer in a Hat Store

"I dropped into the hat store around the corner to get myself a new straw hat. I know the boys there fairly well and is was a handy place for me to pick up a lid when I felt that impulse. So I really was a regular customer—but I'm not any longer. Now the fitting of a hat is not as delicate or scientific a matter as the fitting of a shoe, but I happen to have a bump on my cranium, which sort of complicates matters, particularly with a straw. My headgear must be just such a shape, if not, it will either crowd my brains, or, on the other hand, imitate a toy balloon at every street corner, so it takes a little time for me to satisfy myself. On the occasion referred to, the salesman greeted me affably and produced a couple of hats in the size I asked for. I tried them on, but they came in conflict with that bump and I discarded them. "Not quite my shape," I said, "let's have another." He handed me another promptly enough, but it wasn't right either, nor was the next nor the one following that. By this time my man's affability began to wane.



He said to himself "If this fellow wants a wide selection, I'll let him have it," and he began throwing a whole crowd of hats on the counter, without bothering to hand them to me. He knew very well that I had come in to buy and would buy before I left, but he just didn't have the patience to be courteous when I delayed him a bit. I finally did get a hat that suited me, paid my money, and left without expressing my opinion of his salesmanship—I didn't want to make myself unpopular with a neighboring merchant. But henceforth my bump gets fitted elsewhere.

Promptness Pays

The writer had an annoying experience in making a purchase from a store at a corner where he boards a street car for the office every morning. On entering he found the store empty, but with someone in the adjoining room who obviously knew of his presence. The store keeper finished something he was doing—taking 2 minutes—before coming into the store, then he had to go back for change. The purchaser lost his car and waited five minutes for another—precious minutes when they mean punctuality. He purchases that article three or four times a week, but once was sufficient at that store.

The Salesman Told a Lie

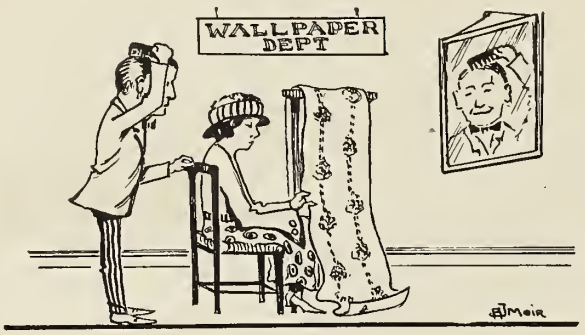
Force of habit, I suppose, prompted me to visit the furniture department of a large departmental store when in quest of a chiffonnier. Because I wanted to fit this piece of furniture into a niche in the wall it was necessary that it should be a certain width. The salesman who attended me showed all the lines the company stocked and solemnly assured me that chiffonniers were not made in the width I desired. On this assurance I purchased the narrowest they had.

When I had occasion to visit a retail furniture store a few days later almost the first thing my eye rested upon was a chiffonnier, which on further examination, proved to be exactly the width I desired.

My confidence in the departmental store has received a rude jar. Either the salesman purposely made a false statement to make the sale or else he was ignorant of the fact that this article was made in the width I asked for. In either case I have made my last purchase in the furniture department of that store.

Speaking of Service

Speaking of service—my wife recently visited one of the large departmental stores to purchase some wall paper. A young man waited upon her. Producing a book of patterns, he then draped himself across the counter; then leaning forward he gazed over my wife's shoulder and proceeded to comb his hair. There was a mirror on the opposite side of the aisle. All the time his mouth was conspicuously opening and shutting in the process of chewing gum.



As the pattern book did not contain the desired patterns, he was given a description of what was required, but made no attempt whatever, to try and find them on the shelves or in any other way. He offered no suggestions or alternatives.

The consequence was, my wife left without purchasing, going to another store, where she obtained what she was looking for. Doubtless the first store could have satisfied her requirements had the man given her "service" instead of only "waiting" upon her.

The man who pays more for his rent than for window decoration and newspaper advertising must be unsuccessful as a merchant.—Marshal Field.

Service With Shoe Laces

He felt he was not entitled to a great deal of attention when going into a well appointed shoe store for a pair of shoe laces. His request brought a friendly smile and the reply, "Yes, sir—for the shoes you are wearing? The clerk then went to the trouble of bringing out two or three shades of brown and asked the purchaser to put his foot up on the rest so that he got the nearest match to the color of the shoe.

The clerk remarked upon the desirability of having the right shade of lace and discussed the shoe styles being worn. "When you are thinking of some new shoes, come in and see us," was the parting remark.

There are many shoe stores in Toronto, but he will remember that one on Blank Street when he is buying shoes again.

This Saleslady Knew Her Business

"I have just the shape of hat you want," said the milliner to a prospective customer. "Here it is—a lovely brown!" "That won't suit me," said the customer, "as I could never wear brown." With that she turned to go. Her prejudice against the color was a strong one and founded on past experiments with it.

"This hat is an unusually pretty shade," said the saleslady," and would blend beautifully with the suit you are wearing. Anyhow, there is no harm in trying it on, even if you do not take it. Just put it on, madam." The customer yielded and was agreeably surprised with the result. The prejudice was removed and a sale made through the tactful persistence and sense of color harmony possessed by the saleslady.

A Large Transformer Order for French Railway

The Westinghouse Electric & Mfg. Company has built for the Chemins de Fer de Midi, France, twenty-five transformers rated 6667 kv.a. each, for 50 cycle system. These transformers are going to be used on a nominal 150,000 volt system which is to be the voltage adopted for the new national transmission system.

Diamond State Fibre Company

A. J. Ballard, Diamond State Fibre Company, has been confined through illness to his home for the past two months. He is progressing favorably. The Diamond State Fibre Company will again display their extensive lines of electrical and miscellaneous fibre products at the Canadian National Exhibition at Toronto this year. The company will have two display booths one in the Manufacturers' Building and the other in Machinery Hall.

At the first meeting of the Quebec Power Co., formerly Public Service Corporation, an issue of $20,000,000 of bonds were decided on.

5000 Luminaires Installed in Mount Royal Hotel



Fig. 1

One of the Largest Lighting Contracts Ever Awarded—Installation Completed in Ten Weeks—Careful Study of Job Beforehand—Work Arranged to Fit in With Progress of General Contractor

By L. V. WEBBER*



Fig. 3

The Mount Royal Hotel, Montreal, is remarkable in that it is the largest hotel in the British Empire, as it can accommodate approximately 1,500 guests and was built in record time. Among other electrical features the lighting installation is worthy of note. The outstanding points of the lighting contract, were quantity, the facilities for handling and the speed of installation.

Approximately 5,000 lighting units were put together and erected which meant about 75,000 operations before the luminaires, including metal parts, lamps and glassware, were ready for use. The typical luminaires used are illustrated by the cuts, No. 1, bedrooms; No. 2, bathrooms; No. 3, corridors; and No. 4, retail stores; also the lighting in the basement, laundry, engine room, refrigeration plant and various work shops. The major part of the installation work which was completed in ten weeks, was supplied and installed by the Morris-Lloyd Lighting Studios Limited.



Fig. 2

*Montreal Representative Jefferson Glass Co.

The metal parts of the luminaires were made of brass spinnings of No. 20, B & S gauge; the leafwork was of heavy brass castings. The whole of the glassware used was supplied by the Jefferson Glass Company (Limited) and was nearly all of their well known Canadian made high efficiency type of Sol-lux glass for which special designs were made for this hotel.



Fig. 4

It is interesting to note the consumption of power in some of the typical locations which, being exceptionally low, speaks well for the small absorption of the glassware. The size of lamp used in the average bedroom is 100 watts, nitrogen; in the bathrooms, 25 watt tungsten; in the corridors, 25 watt tungsten, and in the retail shops 200 watt nitrogen lamps are used in enamelled dustproof units to exceedingly good effect.

Bearing in mind the fact of the size of the hotel and remembering that quantity must be the guide in making a success of the installation work, a classification was made of the various operations and the electricians were so placed that each one could do that portion of the work he could do best. An accurate record was kept of each fixture

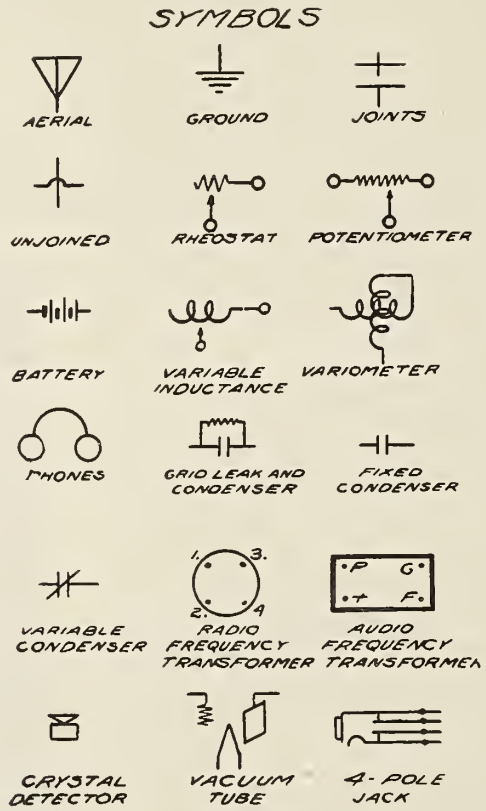
(Concluded on page 47)

Dealers Can Standardize Radio Symbols

At the present time there are two or three different sizes, or symbols for every single piece of radio apparatus. It is easy enough to see when a set of phones are meant, but some of the other things are confusing, to say the least. Every dealer who sells radio apparatus finds fans bringing in blueprints and drawings with strange and mysterious signs on them, and he loses a great deal of time in straightening out the mix-ups.

Give Tables of Symbols to Customers

The accompanying table is furnished by courtesy of the Rauland Mfg. Co., and presents a set of easily understandable symbols that



A Table of Radio Symbols

mgiht well be followed universally. Dealers can render a pleasing service to their customers by including a reproduction of such a set of symbols in any mail matter they may send them, or in the parcels they purchase. Beside winning goodwill for themselves by this service, they are also helping to standardize the industry.



A young lady reposing on a mammoth radio set at a recent convention. Diamond Fibre was used in its construction

Evade License Fees in England

"Thousands of people are apparently content to evade the radio license and to listen-in for nothing," said Lord Gainford at a recent meeting of the British Broadcasting company. "I need hardly comment," he added, "on the statement, officially made, that at the end of February only about 80,000 licenses of both kinds had been issued. If this figure were multiplied by four or five, we should probably be nearer the number of receiving sets in the country. There appears to be a wholesale evasion going on. The loss of revenue from which we are suffering is of the most serious concern

Radio Enables Deaf to Hear

Efforts to afford relief to the deaf and dumb by means of radio are producing encouraging results. One child of twelve, deaf and dumb since birth, had his hearing developed to a point where he became so familiar with sounds describing objects that he pronounced the word "Dog" when a picture was shown— the first word he had ever spoke in his lifetime.

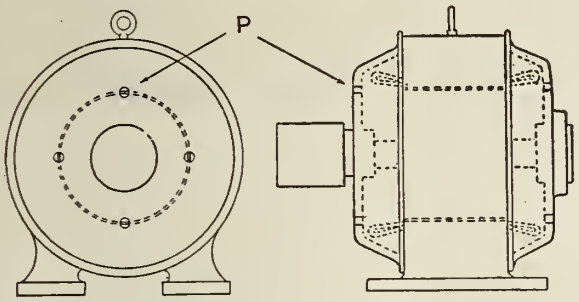
Doctor Marconi now prophesies that commercial telephoning across the Atlantic will not be feasible for two or three years.

A new advertising leaflet (F. 4538) on the waffle iron has just been issued by the Westinghouse Electric & Manufacturing Company.

A Page of Practical Ideas

Testing Clearance on Enclosed Type Motors

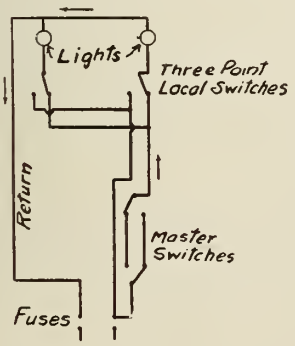
The end shields of enclosed type machines frequently prevent a view of the clearance space being obtained and it is often difficult to apply feeler gauges from the inside of the frame. In such cases suitable holes, say ½ inch in diameter may be drilled in the end shields, the holes be-



ing arranged in pairs opposite to one another, as shown in Fig. 19. In this way a sight of the clearance space may be obtained, and a feeler gauge used. When the machine is working the sight holes may be closed by suitable removable screwed plugs.

Control of Lights from Different Points

Though well known to experienced wiremen, the question of how to wire for the control of lights from local switches and also from a



master switch. still comes up. The accompanying diagram shows an answer to this question. As the plan is drawn, the lights are off.

Saving Time When Selling Wiring Supplies

Weighing, instead of counting, is a method for selling certain small articles, that saves a great deal of time. The idea has been carried out by one firm as follows:

A clerk counted out 25, 50, 75 and 100 of each article, weighed them and then had a typewritten schedule prepared and pasted on the bins. If a customer wants seventy-five 3″ tubes, the clerk weighs out 4½ pounds, as that is what the schedule shows he should get. Naturally, the idea is only worth carrying out by those firms who do a great deal of business in these lines.

Small Bins Make Stock Handling Easy

An idea that has been adopted by an electrical dealer in his shelving arrangement, has been found to make stock handling easier. The wall shelving has been arranged so that the small bins containing a carton or unit quantity are within easy reach, while the reserve stock is on open shelves above, as near in line with the bin as possible. Each bin is labelled with the retail price and what minimum stock should be.

Glebe Electric

We invite you to our showrooms to see our large assortment of

ELECTRIC FIXTURES

Our Prices are Right

SERVICE

N. McLEOD

1324 Danforth Ave. Phone Gerr. 3576W

A card that is left in all newly built houses by an enterprising dealer

A Job Stands on Its Own Legs

The Profitless Habit of Working to Beat the Other Fellow—What is the Average Financial Life of the Electrical Contractor-Dealer—No Alibis Avail

Wholesale salesmen, men seeking business, and even the writer, frequently visit contractor-dealer establishments and this is what we find:

As you enter the place of business, faintly through a haze of blue smoke you see the proprietor with rumpled hair, being gradually buried in a pile of pencil shavings, and you hazard a guess that all is not well.

Why all this pencil sharpening and cursing?

To beat the fellow down the street—that is the real reason—alibis are numerous—

"I am not doing much right now—I have to get a job."

"I have to keep my crew together."

"By Jinks, if Sam can do a job at that figure I can too."

All alibis and all **absolutely false** reasoning.

Just as long as the electrical contractor does not recognize the fact that a Job Must Stand on Its Own Legs, without the support of any bolstering alibis, he will continue to struggle from one bit of trouble to another.

Why is the average financial life of an electrical contractor less than five years? Because he will not recognize the principle that every job must stand on its own legs, and in addition help support the business establishment.

Electrical contractors, if they are to thrive and prosper, must recognize the facts and stop tendering on jobs that will not show a real profit.

When you buy an automobile the salesman extols the value of his car above all others—he does not shave the price. When you buy a typewriter for your office the salesman does not haggle over price—he extols the merit of his machine—he is a salesman.

When the electrical contractor becomes a salesman he is above competition.

If he cannot get a job at a real profit he does not get the job.

If the time spent in worrying over what the other fellow is doing and trying to outdo him, even in sharpening pencils, was spent in learning salesmanship and in selling, the industry would prosper.

Learn as a creed these words—"If a job does not stand on its own legs I do not want it.

If you do not believe this, you are heading for a business death, and when you die you are apt to carry some of your own little world along with you.

Learn to Sell—Take a Job at a Profit—and Live and Let Live.

Wiring Contracts Awarded

Regina, Sask.

Espley Electrical Co., $100,000 collegiate institute.

St. John, N. B.

Driscoll & Mackie, $8,000 tenement.

St. Vital, Man.

Schumacher-Gray, Ltd., $60,000 add. to school.

Sault Ste. Marie, Ont.

Taylor Bros., $2,500 cottage.

J. H. Stearns, $15,000 store block.

Three Rivers, P. Q.

Henri Guilbert, $5,000 house.

Toronto, Ont.

Clegg Bros. (79 Blackthorne Ave) $6,000 house.

Patterson Electric (605 Yonge St.), $20,000 alts. & add. to church.

R. A. L. Gray & Co. (85 York St.), $30,000 alts. & add. to church.

Mather Elect. Co. (1479 Yonge St.), $6,000 ea., 3 houses.

Nichol & Fagan (111 Logan Ave.), $8,000 ea., 2 stores & apts.

Quebec, P. Q.

Tanguay & Chenevert, $279,013 add. & alts. to school.

O. Picard & Fils. $60,000 bank.

Windsor, Ont.

F. D. Reaume, $4,500 house.

Alfred Hild, $4,500 house.

David Moore, $4,500 house.

John Mailleaux, $4,500 house.

5,0000 Luminaires in Hotel

(Continued from page 43)

and piece of glassware delivered to the job, and the history of it until it was installed. The record guarded against theft, listed the name of the electrician who installed the fixture and where it was erected. By this means it was possible to check the quantity of fixtures installed by each man, each day and where he installed them. This proved helpful in two ways. First it gave a close estimate of the cost of installation during the progress of the work. Second should trouble arise on any particular fixture, the man who made the error was sent back to correct it and invariably it was rectified in very short order, the result being that when the final inspection was made there was only one error in the erection, where one fixture had been missed.

At no period during the erection of the hotel was the progress of the general contractor or sub-contractors delayed through the fault of the Morris-Lloyd Lighting Studios, their work being very much facilitated by the manufacturers who supplied the material exactly when it was wanted. The assistance given by the general contractor to the manufacturers and sub-contractors in obtaining their material was the best service most of them had ever experienced on work of this kind.

Obituary

The announcement of the death of Dan M. Logan, on July 15, came as a shock to a very wide circle of electrical friends and acquaintances. Mr. Logan, for some twenty years, was identified with the Canadian General Electric Company, latterly as sales manager of the Lamp Department. A few months ago he left the C.G.E. to associate himself with B. F. Anderson, Hamilton, in the lamp jobbing business.

Must Use 660 Watt Sockets

A notice has been received from Mr. A. G. Hall, chief electrical inspector, to the effect that as at the time the 660 watt socket ruling was put into effect, it was difficult to obtain 660 watt sockets of the pull-chain type, it was necessary for his department to make exception to the rule and permit the use of 250 watt pull-chain sockets.

They have now, however, received information to the effect that the socket manufacturers of Canada are now prepared to supply the demand and fill all orders for 660 watt pull-chain sockets of an approved type.

Notice is therefore given, that after September 15th next, the 660 watt socket ruling will be rigidly enforced, and sockets of any type of a lower rating than 660 watts will not be accepted for installation in the Province of Ontario.

Prominent Electrical Contractor Dealers

— 12 —

C. W. HILLAS, Edmonton

C. W. Hillas was born at Belfountain, Peel County, Ontario, but the call of the West prevented him becoming a pillar of the electrical business in that province. His parents moved to Calgard in 1899. and C. W. completel his schooling in the Calgary High School.

In 1906 he graduated ,and the lure of the electrical business drew him to a position with the North



C. W. Hillas

West Electric Company. Here he remained until 1911, when the firm was taken over by the Northern Electric Company. In that year he formed a partnership with H. H. Depew, under the name Depew-Hillas Electric Company, in Edmonton, and a general electrical business was carried on.

In 1917 Mr. Hillas bought out his partner's interest and commenced under the present name, Hillas Electric Company. The store is located at 10041 Jasper Avenue, in the very heart of the city and is complete in all departments. Mr. Hillas has handled a number of large contracts, and is equipped to take care of nearly anything in the electrical line.

He is a firm believer in the future of the electrical trade, and his square ways of doing business explain his success.

Sermons by Radio

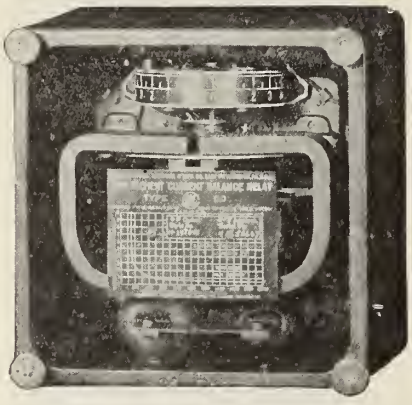
Cardinal Dubeis, the latest Parisian radio fan, has given permission to French priests to broadcast their sermons through Eiffel tower or commercial wireless stations. "But I will not authorize the installation of receiving apparatus in churches or other religious buildings, for moral instruction should always be oral," he says.

The Latest Developments in Electrical Equipment

A Current Balance Relay

A current relay that requires no more apparatus or connections than are ordinarily needed for the simple overload (short circuit) protection of transmission lines has been developed by the Westinghouse Electric & Manufacturing Company for giving balanced protection to transmission lines.

This relay works on the induction principle and operates on current alone, so that no source of potential is required. It has two overload elements acting upon a common disc through a



common magnetic circuit. Each element is connected separately to its own current transformer in corresponding phases of the two balanced lines. The two elements are electrically opposed, and under conditions of balanced line loads the fluxes in the magnetic circuit of the relay are equal and opposite, giving a resultant zero torque on the relay disc. Under these conditions the disc which carries the moving contact is held in a mid-position by the control springs. These springs are initially restrained in the zero position, which prevents the disc from making any movement until a predetermined current unbalance exists between the two lines. Under theproper condition of current unbalance the disc can rotate 80 degrees in either direction from zero and make contact on either side.

The differential current which is required to trip the relay is practically the same for all load values of line current in the lower loaded line. If, however, one line of the balanced pair is open, the current in the relay necessary to cause it to trip out the remaining line is approximately twice the differential current setting. This automatic doubling of the current setting with one line open is due to the fact that half of the operating coil of the relay is then no longer active, as it receives no current from the dead current transformer in the open line.

It will be noted that when one of the lines is opened the differential relay is then automatically converted into an overload relay, with a trippling current setting of twice the differential setting, and with the disc tending to rotate in such a direction as to trip out the loaded line. This means that the remaining line may then be considered as provided with overload protection without the use of additional overload relays, if so desired. It should be remembered, however, that the current balance relay is set for a short time operation, which is not usually desirable for overload protection.

Differential current settings of 3, 4, 5, and 7 amperes, are provided. The relay has an inverse time curve, with a definite minimum time of operation, adjustable from instantaneous to 0.5 second.

The current balance relay can be used at the transmitting end of any number of parallel feeders or at the receiving ends of any number of parallel lines in a system having a source of power at both ends, or at the receiving ends of three or more parallel lines in a radial system.

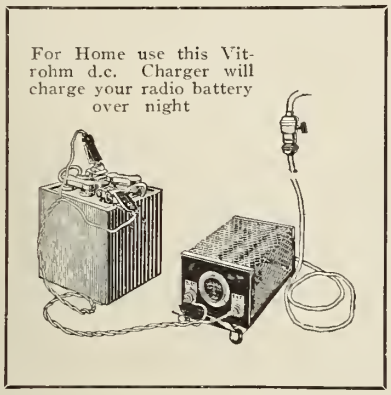
The current balance relay can also be used for the ground protection of parallel transmission lines. The neutral currents of the two lines are then balanced against each other and in case of a ground on one line the predominance of current will be in the neutral of the grounded line. The ground CD relays are identical with the line CD relays except that they operate on lower differential current values.



The heavy-duty Reelite, for laying out and retrieving electric cable, installed on sand cutting machine

Ward Leonard Battery Charger

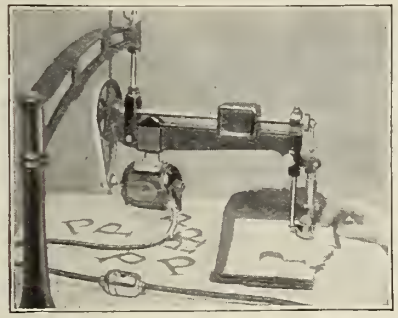
A Home Battery Charger of efficient design is being marketed by the Ward Leonard Electric Company, Mount Vernon, N.Y. The device



is shown in the accompanying illustration. The resistors are of Ward Leonard Vitrohm construction. The charger is designed especially for radio users.

Electrically Driven Stencil Cutter

A machine that does the work of cutting stencils for window displays, etc., has been developed by the International Register Company.



A small chisel making 2,000 strokes per minute does the cutting. At the top of each stroke, the chisel leaves the work. The machine is equiped with 1/20 horse power universal motor.

Lang Unit

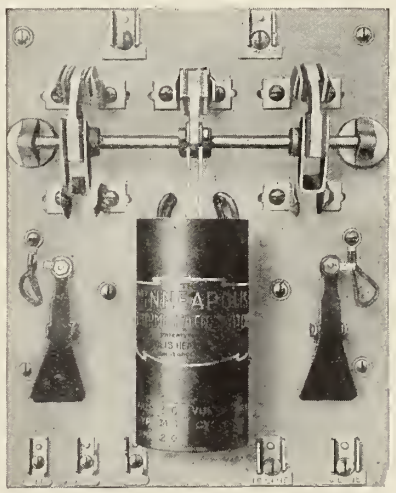
After ten years of laboratory work, involving thousands of experimental tests Mr. Neil Lang, of Vancouver, B. C., has evolved a reflector which is claimed to give a practically perfect daylight effect to artificial lighting.

Analysis of the spectrum of daylight, shows a composition of Red Orange rays, 21 1/2%; Yellow Green rays 32%; and Violet Blue rays, 46 1/2%. The nitrogen lamp, admittedly one of the best artificial lighting units known, fails to meet daylight conditions inasmuch as it gives a marked excess of Red Orange rays and corresponding deficiency of Violet Blue rays. The result is an imperfect color definition which alters tints and shades to a marked degree from that given by daylight in the quality of the light Mr. Lang claims that his Daylight Reflector is a medium which, without reducing in the least the efficiency of the lighting unit, alters its rays in such a manner as to give a spectrum which practically corresponds with the daylight spectrum or in other words, to give a daylight light.

The Daylight Reflector is endorsed by Prof. J. G. Davidson, head of the Department of Physics, University of British Columbia. It is now in use at many points on the Pacific Coast. It is patented in Canada and the U. S. and is manufactured by Lang's Daylight Ltd., of which firm the inventor is head, Vancouver, B. C. The company is now planning to introduce the invention in Canada and U. S.

Thermostatic Relay Switch

A new type of switch for the thermostatic control of motors, electric heating units and other electrical units is being marketed by the Minneapolis Heat Regulator Co., Minneapolis. The unit is stated by the manufacturers to be in reality a double control switch providing a low voltage circuit to the thermostat operated at



7½ volts at less than 15 watts. The power for this low voltage circuit is provided from a transformer built integrally into the relay. The thermostat on temperature changes selectively energizes two low voltage magnets which in turn energize 110-volt solenoids closing or opening the main line circuit to the motor or other apparatus to be controlled.

Current News and Notes

Acton, Ont.

In order to meet the present and growing demand for current, the Hydro-electric Power Commission has decided to double the capacity of the power station at Acton, Ont., by the addition of three new 100-h.p. transformers.

Acton Vale, Ont.

A water pumping system, which includes four centrifugal pumps, two electric motors and two gasoline engines, is being installed in Acton Vale, Ont.

Batiscan, Que.

An electric motor is required for a centrifugal pump for the new water supply installed at Batiscan, Que.

Brittania Beach, B. C.

The new power line of the B.C.E.R. Co., from Whytecliffe to Brittania Beach, B. C., will be about 22 miles long and is 7 strand steel core aluminum wire.

Beeton, Ont.

There are a large number of unwired homes in the vicinity of Alliston, Tottenham and Beeton, and the councils of the municipalities propose to assist in financing the cost of wiring and installing ranges by carrying the greater portion of the expense on the deferred payment plan. Arrangements to do this are now being completed.

Brandon, Man.

A serious boiler explosion put the Brandon Electric Light plant completely out of commission, for a short time in July.

Cooksville, Ont.

A hydro-electric system for Cooksville, Ont., is under consideration.

Courtland, Ont.

A Hydro line is contemplated from Tillsonburg to Courtland, Ont.

Calgary, Alta.

Commissioner A. G. Graves has formerly filed the City of Calgary's application for a power site and water storage basin, 35 miles up the Elbow River, in order to establish flood control over the Elbow River. To carry out the development fully would require probably an expenditure of $2,500,000, but for the expenditure of a smaller sum embracing the construction of a proper dam, flood control of the Elbow River could be established immediately.

Campbellford, Ont.

A contract in connection with the building of a new power house at Campbellford, Ont., has been let by the Hydro Commission to the Sinclair Construction Company. The tender is for $250,000, and includes the erection of the power house and the tail race.

Duncan, B. C.

The Canadian Fairbanks-Morse Co. are supplying motors and pumps for a waterworks system in Duncan, B. C., value $8,000.

Esquimalt, B. C.

A battery of three electrically driven pumps with a capacity of 180,000 gal. per minute will be used in the government dry dock at Esquimalt.

Finch Twp., Ont.

A request has been received by the Hydro-electric Power Commission from the council of Finch Township, Ont., for estimates on the cost of service to rural residents in the township.

Fort Rouge, Man.

Under a protective arrangement whereby the city may expropriate the system under certain conditions any time after the first five years, extension of a 20-year franchise or license to B. W. Parker to establish an electrical heating system in Fort Rouge, was approved at a meeting of the special committee dealing with the matter recently.

Hemmings Falls, Que.

It is reported that tenders for the power development at Hemmings Falls, Que., will probably be called by the Southern Canada Power Company, in September.

Halifax, N. S.

M. C. Smith, heretofore superintendent, Light Power and Railway Departments, Nova Scotia Tramways & Power Co., Halifax, N. S., has been appointed manager, Cape Breton Electric Co., Sydney, N. S., succeeding C. C. Curtis.

Hawkesbury, Ont.

A valuation of the distribution system of the Hawkesbury Electric Light and Power Company, Limited, in the town of Hawkesbury, Ont., is to be submitted to the municipality of Hawkesbury by the Hydro-electric Power Commission of Ontario. This is in connection with the recent request from this municipality for estimates on the supply of 1,000 to 2,000 h.p.

Jarvis, Ont.

A request for electric service has been forwarded to the Hydro-electric Power Commission for Jarvis, Ont. It is expected that power will soon be available.

Montreal, Que.

Some of the electrical workers of Montreal, who are affiliated with the International Brotherhood of Electrical Workers, are asking an increase of ten cents an hour in wages and notice has been served on contractors and on the Electrical Co-operative Association that the union wishes to sign an agreement calling for the payment of 75 cents an hour to journeymen

and armature winders; and 50 cents an hour to helpers. The present rates are 65 cents and 40 cents.

Martintown, Ont.

Extensions to existing hydro lines are being constructed to supply additional rural consumers in Williamstown and South Lancaster, Ontario.

Moose Jaw, Sask.

A new selective telegraph apparatus has been designed and patented by Irving Nachumsohn, who is employed at the present time as supervisor of the Canadian Pacific railway telegraphs at Moose Jaw, Sask. The apparatus consists of a new design typewriter, electrically controlled and operated on the permutation code principle. The sender will sit down at his machine and type off a letter or message as he would on an ordinary typewriter and the receiving apparatus will record it in printed form.

New Liskeard, Ont.

A report states that the Great Northern Power Company, have signed contracts with the Night Hawk Lake Mines for 1,500 horse-power, the Newray for 1,000 horse-power, the Porcupine Davidson for 1,500 horse-power and the Matachewan Canadian. Contracts have also been entered into to supply power to two Matachewan companies, and another contract is under negotiation. Four other Porcupine companies than those mentioned are negotiating with the Great Northern Co. for power; also two companies in Gowganda.

North York Twp., Ont.

North York Township Council on July 16, passed two by-laws, creating areas for electric lighting and power; one for the area adjacent to Weston, and one to supply a mile and a quarter area on each side of Yonge Street, from the southern to the northern boundaries.

Ottawa, Ont.

The Ottawa and Hull Power Co., have started work on the construction of their transmission line in Murrell section. The wires will be carried on metal crossarms, attached to twin posts set at intervals of about 240 feet.

George Crawford, formerly electrical instructor in the Hamilton technical school, has accepted a similar position at the Ottawa technical school, his duties to commence in September.

An electrically driven postage meter that will seal and stamp an envelope, marking the requisite postage, all in one operation, has been approved by the Postmaster-General in Ottawa. Several are already in use.

Quebec, Que.

Louis Burran, Electrical Engineer, Quebec Ry., Light, Heat & Power Co., was given a gold mounted walking stick and a number of other articles by members of the power division and head office staffs, on retiring after about thirty years service with the company. Mr. and Mrs. Burran soon after sailed from Quebec for England, on a three months holiday trip.

Regina, Sask.

The Regina, Sask., City Council has offered to accept $2,100 a year for advertising privileges on the municipal railway cars provided the Canadian Street Car Advertising Co. will enter into a contract for five years. The company asks for a 10-year contract.

Redcliff, Alta.

The power plant at Redcliff, Alta., was struck by lightning and totally destroyed in a heavy storm recently. The damage is estimated at $15,000.

St. Jacobs, Ont.

Work is just being started on the Hydro line from St. Jacobs, to Linwood, Ont.

St. John, N. B.

At a meeting of St. John city council on July 12 the report of Engineer Wilson was read. He recommends acceptance of the lowest tenders for line material, as follows: E. Leonard & Sons, $39.37; H. M. Hopper, $785.25; Northern Electric Co., $246.19; Canadian Gen. Elec. Co., $1,993.67. The report was adopted.

The firm of Dexter & Richards have been awarded the contract for construction of a new dam at Log Falls in the Musquash hydro area, near St. John. The permanent portions of the dam are to be of concrete and the contract price is said to be in the vicinity of $83,000.

St. Thomas, Ont.

The erection of four suburban Hydro-electric zones, centring in St. Thomas, has been authorized by the Ontario Hydro Commission, and construction work will be started in the near future. The zones named in the order are: St. Thomas to Shedden, via Fingal, following the old Talbot road; St. Thomas to Union, following the London and Port Stanley gravel road; St. Thomas to New Sarum, following the Aylmer high tension power line along the St. Thomas-Aylmer section of the Provincial highway; and a line from the city along the Edgeware road. The power will be distributed from the high tension station on the Eighth Concession of Yarmouth. An extension to the new ground of the St. Thomas Golf and Country Club will be made from the Union zone. The development will benefit hundreds of farmers in the seven mile circle described.

Sault Ste. Marie, Ont.

No further action will be taken by the city council of Sault Ste. Marie, Ont., on the report of the Ontario Hydro-electric Power Commission on the power still available for development in the St. Mary's Rapids until a further report on the cost of such development is received from the commission.

Timmins, Ont.

Vipond Consolidated Gold Mines are increasing their mill capacity to 150 tons. It is reported that additional electric equipment will be required.

Toronto, Ont.

Plans are being prepared for the construction of

a new high tension station in the north-west part of Toronto, by the Hydro-electric Power Commission, at which two banks of outdoor type transformers will be installed, each having a capacity of 15,000 kv.a.

Tenders are being received by the Chairman of the Board of Control, Toronto, Ont., until noon Aug. 21st for supply and installation of 2-2,880,000 imp. gallon centrifugal sewage pumps and motors.

G. M. Anderson, formerly with the Shawinigan Water and Power Co., has been appointed manager by the Great Northern Power Co.

Welland, Ont.

The Sage Electric Company has secured the contract for the installation of electrical equipment at the new Welland Cotton Mills, and at the Welland Packing Company's plant.

Warkworth, Ont.

Contracts for the supply of Hydro-electric service to Warkworth, Ont., have been executed. Sufficient contracts have been obtained to ensure successful operation..

Work is proceening rapidly on a hydro line running from Bradley's Corners, through Norham, to Warkworth, Ont.

Walkerton, Ont.

The street lighting committee of Walkerton, Ont., has recommended the council to accept the proposition of the Walkerton Electric Light and Power Commission to increase the street lights on Durham street from 100 watts to 250 watts at a cost of $9 per lamp per year, and supply new non-glare shades free of cost.

Wiring Contracts Awarded

Barrie, Ont.

F. Burton, house, Bayfield Street.

Birchcliffe, Ont.

A. L. Reid, $5,000 house.

Brockville, Ont.

G. E. Parslow, $20,000 office building.

Burlington, Ont.

Hunter & Strome, Hamilton, $15,000 house.

J. A. Dynes, Hamilton, $15,000 house.

Cooksville, Ont.

Patterson Electric Co., Toronto, $20,000 school.

Dundas, Ont.

Farnham & Sons, Hamilton, $4,500 house.

Elmira, Ont.

W. Rahn, house; $4,000 house.

Ford, Ont.

Gilbert Campeau, $4,500 house.

Fredericton, N. B.

Wm. Boone, North Devon, $5,000 house.

Hamilton, Ont.

Geo. Evoy, Bartonville, Ont., $10,000 house.

Kitchener, Ont.

Star Electric Co., $4,500 house.

London, Ont.

Bowley Electric Co., $15,000 gymnasium.

Peoples Electric Co., $50,000 registry office.

Montreal, Que.

C. Laurin, $6,000 house.

Wm. Gauthier, $6,000 house; $7,000 house.

W. Staines, $110,000 apartment house.

H. Truchon, store (departmental)

A. Boismenu, 2 houses $12,000.

R. Chamberland, $35,000.00, 12 flats.

Booth Bros., $60,000,00, 6 pr. semi-det. houses.

Canadian Comstock Co. Ltd., $1,500,000 addition to store and heating plant.

Mount Royal, Que.

Collyer & Brock, $40,000 addition to school.

New Hamburg, Ont.

Geo. Morley, $10,000 school; $5,000 house.

Niagara Falls, Ont.

Clifford Electrical Co., St. Catharines, Ont., garage; store.

Ottawa, Ont.

Marchand Electric Co., $2,500,000 hospital; $50,000 apartments.

W. Cowell, Westboro, $5,000 house.

E. Headley, $7,500, two houses.

Stan Lewis, $5,500 house; $150,000 office building.

H. L. Allen, $5,000 house; $5,000 house.

Jos. Ladouceur, $5,500 double house; $7,000 house; $6,000 house.

J. Ellicott, $6,000 house; $10,000 house.

G. Young, $6,000 house.

J. Walsh, $6,000 house.

Outremont, Que.

J. A. Roy, $80,000 apartment house.

Port Colborne, Ont.

Chester Bears, Ridgeway, $6,000 house.

Quebec, Que.

P. P. Giguere Co. Ltd., $97,301 school.

St. Catharines, Ont.

C. Widdicombe, $35,000 alterations and addition to Sunday school.

St. Anthony, N. B.

Ourelle Legere, Moncton, N. B., $50,000 church.

Sandwich, Ont.

C. Usher, $4,000 house.

Saskatoon, Sask.

Dawson Elec., $4,000 house; $34,500 school; $32,795 school.

Wheaton Elec. Co.., $7,000 house; $7,000 house; $7,000 house.

Dawson Elec. Co., $29,785 school.

Sault Ste. Marie, Ont.

Taylor Bros., $12,500 extension to bake shop; $3,000 house.

O. C. Carnery, $35,000 Nurses Home "Gibson Memorial."

Greenwood Elec. Co., $10,000 extension and new store front; $6,000 extension to building.

Taylor Bros., $12,000 addition to mill.

Stratford, Ont.

Peter Sylvester, $7,000 house.

Stratford, Ont.

W. J. Gaul, $3,000 house; $4,000 house; $4,000 house.

Sydney, N. S.

Campbell & Desmond, $4,500 house.

Thetford Mines, Que.

Canadian Comstock Co. Ltd., Montreal, $500,000 asbestos mill.

Toronto, Ont.

Patterson Electric Co., $35,000 completion of "North Toronto" collegiate; $15,000 house; $30,000 completion of collegiate (Malvern); $15,000 house, Moore Park.

Canadian Comstock Co., Montreal, $750,000 addition to departmental store, S.S. Queen W., near Yonge Street.

T. B. Kilner, $5,000 bungalow, W. S. Bowmore, near Eastwood Ave.

Moss & Stocks, $20,000 duplex house, 169 Glen Road.

H. C. Stacey, 2 pairs houses, south side Robins Avenue, near Coxwell.

S. Johnston, $8,000 pair houses, west side Cannon, near Gerrard E.

Uxbridge, Ont.

Jack Bustard, $75,000 school.

Vernon, B. C.

Okanagan Electric Co., $9,000 alterations to office building.

Winnipeg, Man.

Schumacher-Gray Ltd., $200,000 addition to elevator.

Westmount, Qne.

Booth Bros., $70,000 2 pairs semi-det. houses (Belgium St.)

Windsor, Ont.

F. D. Reaume, $4,000 residence (Marentette Ave.); $4,500 house Lillian St.; $4,500 house, Pierre St.

F. D. Reaume, $7,000 duplex house, Hall Ave.

John Mailleaux, $4,000 house, Elsmere Ave.

Activity in the Border Cities

A spirit that promises results, is evidenced by electrical activity in the Border Cities. There are now formed there, two electrical associations, one known as the Border Electric Home League, and the other as the Border Cities Electrical Association. The membership of the Electric Home League consists of central stations, dealers, contractors, jobbers, distributors and manufacturers who have a bona-fide place of business located in the Border Cities. The membership of the Electrical Association consists of central stations, dealers, contractor-dealers, jobbers and distributors who have a bona-fide store or warehouse in the Border Cities, and who handle electrical goods exclusively.

At the moment, the Border Electric Home League has recently completed a very successful Electric Home Exhibition, of which an account will be given in a future issue of the Electrical News.

The activities of the Border Cities Electrical Association are somewhat broader in scope. It has been formed to promote the interests of the electrical industry in the Border Cities. The Association is putting on an Electrical Show in the Armouries in Windsor the last week of September. R. M. Jaffray will be manager for the show. There are approximately 85 booths in the Armouries and these have been practically all taken up already. All electrical manufacturers, jobbers, distributors, dealers, etc., are co-operating by taking booth space, so it promises to be a very fine Electrical Show.

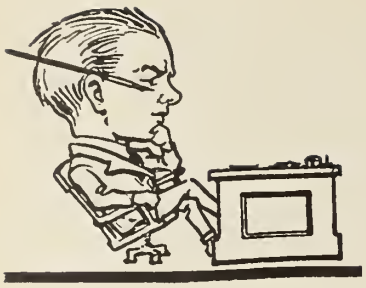
The officers of the Border Cities Electrical Association are as follows: President, O. M. Perry, Windsor Hydro-Electric System; treasurer, V. B. Dickeson, Barton-Netting Co., Windsor; secretary, D. J. Phelan, Windsor Hydro-Electric System; A. E. Roach and M. J. McHenry on the executive.

A Correction

Through a proof-reader's error the name Lincoln-Sangamo Meter Company appeared in our index of dates June 15, July 1 and July 15. The cause of the error cannot be traced at this distance, but apparently it originated in the fact that the Sangamo Meter Company and the Lincoln Meter Company some time ago developed a combination demand-energy meter which is made up of the Sangamo watt-hour meter and the Lincoln demand meter. There is no other connection between the two companies and no such company exists as the Lincoln-Sangamo Meter Company. We make this explanation in view of any possible misunderstanding that may have arisen as the result of our error.

Books Received

"The Dynamo, its Theory, Design, and Manufacture," sixth edition, by C. C. Hawkins, gives a thorough presentation of the principles involved, and the latest methods of their application, in the production of all types of D.C. generators. Typical designs are discussed with illustrative problems worked out in detail; all being treated in the light of present-day practice, and fully illustrated by photographs of modern equipment and methods of assembly. A special feature is the use of stream-line photographs representing flux distribution between poles and armature. The work is in two volumes. The first with 610 pages, price $6.25; and the second with 322 pages, price $4.50. The publishers are Pitman & Sons Ltd., 70 Bond Street, Toronto.



The Editor Comments

Continued Development in North

The announcement just made by the Hollinger Consolidated Gold Mines that work will proceed at once on the construction of a new power plant at Portage Rapids is a further indication and guarantee of the continued development of the Northern Ontario mining district. This plant has a capacity of some twenty-five thousand horse power which will be utilized to the limit. Transmission will be at 110,000 volts and the line will be 80 miles long. This contract follows on the heels of the Quinze River announcement where the Northern Canada Power Company are making a present development of 20,000 h.p. and building a transmission line a hundred and fifteen miles long; eventually their plant will be increased to 60,000 h.p. In addition, the Great Northern Power Company have started up within the last month, a 2400 h.p. unit at Indian Chutes on the Montreal River and the Northern Canada Power Company a 9,000 h.p. installation in two units at Sturgeon Falls on the Mattagami River. Thus the power capacity of this district has already been increased this year by 11,400 h.p.; there is a development under way of 45,000 h.p. and there will be easily available at least another forty thousand horse power as soon as the demand is apparent. In the Sudbury district the Wahnapitae Power Company are preparing specifications for a new power unit of about five thousand capacity with a twelve or fifteen mile power line.

Picking the Easy Sellers

Everybody who has anything at all to do with the selling of electrical goods, recognizes that some articles move more easily than others. Lamps are perhaps the most staple article in the business, and there is generally little selling effort required. At the other end of the scale we find electric washing machines, ranges, vacuum cleaners and refrigerators. What lies between these extremes represents very desirable business for the dealer, yielding a nice margin of profit, with but a small exertion of selling effort. An exact classification is impossible, but in general these goods are toasters, percolators, fans, irons, portable lamps, grills, waffle irons and table stoves.

An unpleasing aspect of the situation is the fact that the hardware stores are getting too much of this easy money. They have neither the knowledge nor the inclination to push the higher priced appliances and pick instead the lower-priced articles of quicker turn-over.

The only discussion about this hardware competition that is of any value, concerns plans to meet it. That it can be overcome is being proved daily, by dealers who make an honest effort to study the science of merchandising. The goods we are talking about are sold over the counter and carried home, in many cases, and with such merchandise, sales depend largely on window dressing, store atmosphere, good stock, and pleasing personality on the part of the salesman.

We Must Guard Our Resources

There are continual evidences of the fact that Canadians do not realize just how far certain moneyed interests in the country to the south of us are prepared to go. It is mightily to our interest to recognize that our present prosperity and the future preservation of our natural resources depend upon our watchfulness.

There is an opinion prevalent among a certain type of U. S. citizen, that the resources of Canada are a reservoir to be tapped for the benefit of the United States. They want our pulpwood, our mines, our water-powers, and are prepared to "go some" to get them. At the moment, members of the American Paper and Pulp Association are emitting a prolonged protest against the suggested Canadian embargo on pulpwood—forgetting that many of their citizens were just as keen for a United States embargo on coal last winter.

A further indication of an inconsiderate viewpoint is presented in a recent issue of a United States magazine. It prints a map, with the larger power centres of the continent marked thereon, and remarks as follows: "One of the most far-reaching conceptions of modern times is shown in this map prepared by Frank G. Baum, hydro-electric engineer, which discloses a plan for a single electric super-power system to cover practically **all of the United States and Canada.**"

The scheme may be scientifically practicable, but Canadians will have to be shown that it cannot endanger the use of our waterpowers for the development of our own country.

Engineering Service Gratis

Every now and then complaints are heard regarding the engineering service furnished by manufacturers of certain machinery. Independent engineers sometimes maintain that such firms furnish a plethora of free service, and conversely, the manufacturers claim that this engineering service is demanded by their customers and cuts all the profit from the business.

With these plaints in mind, it is interesting to note what happened on a small hydro-electric development in an isolated part of Canada. Everything had been going fine until the resident engineer was unavoidably called away. At that time a small cofferdam was just being completed, prior to dewatering a certain area. The superintendent bought pumps—two high head reciprocating type, of small capacity. Naturally these failed to make any progress. A further call to the equipment people produced a sludge rotary, of mining type. This also was a failure, though reinforced by two hand pumps. Finally the engineer came back and remedied the trouble by specifying what was wanted—a pump that would move a large volume of water against a low head.

Thus we have at least one case where there was no abundance of free service.

Top-Heavy Names

There is an old story about a tug-boat owner who bought the discarded steam whistle of an ocean liner. It was installed on his little tug-boat without difficulty, but sad to relate, the first blast whiffed off all the steam from the boiler.

This anecdote illustrates what happens in some electrical stores. The proprietor wishes to make a big noise, and he puts his name across the middle of his front window in letters six inches high, perhaps two or three lines deep. What happens then is comparable to the compulsory stoppage of the tug. Sales from the window fall away off—and the dealer wonders what is the matter, little realizing that his big name-plate is cutting the efficiency of the window in two.

A surprising number of electrical stores are handicapped in this way—the remedy is obvious. Above, below, or on the side of the window is a good enough place for your name, and there is no harm done to the pulling power of the display.

Telephoning Over Power Lines Using Different Frequencies

Telephoning over power transmission lines became an established fact when the new high frequency automatic telephone system just installed on the lines of the Consumers Power Company of Michigan was formally opened recently. This system has just been installed by engineers of the Westinghouse Electric & Manufacturing Company, present at the opening.

The system as worked out is quite flexible. Two frequencies are used. The dispatcher's set transmits approximately 50,000 cycles and receives 60,000 cycles. The transmitter at Battle Creek transmits 60,000 cycles and receives 50,000 cycles. In effect, there are two transmitting sets and two receiving sets in service working through single telephone instruments with the result that the service is duplex and both parties may talk and listen simultaneously.

To communicate with Battle Creek, the load dispatcher at Jackson has only to lift his telephone receiver from the hook. This automatically lights the tubes and starts up the radio transmitting apparatus about half a mile away in the Jackson steam plant of the company. The dispatcher then turns the dial on his instrument to the number assigned to the Elm Street steam plant in Battle Creek. The operation of this dial sends out modulated high frequency impulses over the high tension transmission line through a sending antenna strung parallel to the power line for about 1,000 feet. These impulses are picked up on the receiving antenna at the Elm Street plant and cause a selector there to step around and stop at the proper point and, through the operation of a system of relays, ring a bell or sound a horn in the booth of the Battle Creek station.

The Battle Creek operator unhooks his telephone receiver. This automatically starts up the transmitting radio set at Battle Creek. He then hears the Jackson voice sent out by the Jackson transmitter, and Jackson hears his voice which goes out through the Battle Creek transmitter. The two voices pass each other carried on different wave-lengths, going through different transmitting radio units, but all is tied into the two ordinary telephone instruments and controlled through them.

New Development on Abitibi for Hollinger Gold Mines

Hollinger Consolidated Gold Mines has awarded the contract for a new dam and power house on the Abitibi River to Sir Wm. Arrol, Limited, of St. Catharines, Ontario, and London, England. Present plans call for the installation of equipment with a productive capacity of 25,000 h.p. Some 20,000 h.p. will be delivered at the mines for the use of the Hollinger Company, and a further 2,000 h.p. will be at the disposal of the municipalities in the immediate neighborhood. It is anticipated that the development will be completed and power available for distribution in the fall of 1924. Engineers in charge of design and construction are Kerry & Chace, Toronto.

Arthur L. Atkinson has been appointed radio inspector for St. John and the surrounding district.

C. E. R. A. Convention Voted A Success by 300 Happy Delegates

Well-planned Programme Drew Large Attendance —A Flow of Oratory at Annual Dinner—Interesting Assemblage of Exhibits

An attendance of between 200 and 300 members and guests stamped the nineteenth annual convention of the Canadian Electric Railway Association as one of the most successful in its history. Technical sessions and entertainment features proved equally interesting, and the manufacturers' exhibit drew much attention. The meetings were presided over



H. H. Couzens, President C.E.R.A.

by H. H. Couzens, in the absence of Major Burpee.

A fine convention hall was available in the Music Building at the Exhibition grounds. Transportation from thence to the daily luncheon at Sunnyside Pavilion was provided by the Transportation Commission in motor buses. A feature of this convention was the adequate arrangements made for the entertainment of the ladies, which included a visit to the Royal Canadian Yacht Club and a motor trip around the city.

The general programme was carried out as outlined in the Electrical News of June 15. An executive meeting and the presentation of the secretary's and treasurer's reports constituted the business of the opening day. The technical session on Thursday morning was confined to a paper by Alexander Jackson, superintendent of time tables Public Service Railway (N. J.), in "The Operation of a Scientific Survey of Traffic Movements on Urban Railways." At Friday's session, W. G. Gordon, railway and traction engineer Canadian General Electric Company, presented a paper on "Deciding on the Proper Motor for a Given Cycle of Duty." On Saturday morning, business was confined to the presentation of the report of the committee on "Valuation, Maintenance and Depreciation of Street Railway Assets" and the election of officers for the coming year.

In the absence of President Burpee, his report was read by Mr. Couzens, at the Wednesday luncheon. The report gave some figures as to the extent of the electric railway industry in Canada and included a tribute to the work of the Toronto Transportation Commission as follows: "During the past decade in Canada there has been a pronounced movement toward public ownership of electric railways. I am glad that our association is big enough and broad enough to include all the electric railways of Canada and that quite a number of the publicly-owned railways have become members. The Toronto Transportation Commission, which under the management of the vice-president of the association, controls one



D. E. Blair, Vice-president C.E.R.A.

of the largest Canadian systems, is giving a splendid example of what can be done under public ownership and is rapidly producing here one of the model traction systems on the North American Continent."

Addresses by Controller Hiltz, and Sir John Gibson, featured the luncheons on Thursday and Friday, respectively.

A large and enthusiastic crowd gathered for the annual dinner Thursday evening, June 28. An attrac-

tive menu was laid down and the programme was interspersed with excellent musical numbers which added greatly to the enjoyment of the evening.

The toastmaster's chair was accupied by Mr. H. H. Couzens, vice-president of the Association, in the absence of the president, Major F. D. Burpee. In addition to the toast to the King, the toast list included "Canada," "Our Industry," "Our Guests," "The Ladies," and "The Technical Press."

"Canada" was, very appropriately, proposed by Lieut.-Col. G. C. Royce, and was responded to by Mr. Geo. Wright, whose Scotch accent did not detract from the sincerity of his remarks but, if anything, added emphasis to the glowing picture he painted of the future possibilities of this great Dominion.

In speaking of "Our Industry," Mr. G. Gordon Gale referred to the remarkable changes which had come over the electric railway industry, even within the last fifteen years, and pointed out the necessity for continued development to meet the needs of the travelling public from year to year. The response was made, in a few apt remarks, by Mr. C .B. King, who contended that the industry should be called the transportation industry rather than the electric railway industry. Its business was to carry people, by whatever means of transport. Where the bus could be used to advantage, it was up to the industry to adapt it to their requirements.

Mutual felicitations were exchanged in the toast to "Our Guests," proposed by F. A. Gaby and responded to by Mr. Bucke, who represented the American Electric Railway Association. It was pointed out that Canada and the States had almost everything in common in their problems of electric transportation and the associations could exchange ideas and apply each other's methods with equal benefit to each.

The honor of proposing and responding to the toast which may be considered the toast of the evening fell upon the not unwilling shoulders of Messrs. Hugh Millar and Don M. Campbell. We mean the toast to the "Ladies," and to do them justice, both gentlemen certainly rose to the occasion, though Mr. Campbell was evidently in some doubt as to why he, a mere man, was chosen to be spokesman for those who are acknowledged to be very well able to speak for themselves.

Mr. E. P. Coleman had some apt and kindly words to say about the "Technical Press," to which the veteran, Mr. Acton Burrows, had some eloquent and appreciable words to say in reply. "Auld Lang Syne" followed very appropriately on the remarks of the honored veteran of the industry, and an enjoyable evening came to a fitting close.

Discussion and Committee Report

Discussion was limited owing to the short time available. The secretary had invited officials of member companies to submit questions for discussion and there were included in a leaflet headed "Timely Topics." It was decided that these would be made up in the form of a questionnaire, and answers sent by mail to the secretary.

N. D. Wilson, engineer on traffic studies for the Toronto Transportation Commission, led the discussion on Mr. Jackson's paper. He agreed with the main points and gave some particulars of his work in Toronto.

Reports were received from the Standards Committee, Public Relations Committee, and from a special committee on Depreciation and Classification of Accounts.

Exhibits

Exhibits in the Music Building were arranged as follows:

Allen General Supplies, Ltd., Toronto. Gears and pinions.

Canadian Car & Foundry Co., Montreal. Trucks and other electric railway car accessories.

Canadian Cleveland Fare Box Co., Preston, Ont. Change carriers; fare boxes; fenders; lifeguards; light metal handles; power saving recorders &c.

Canadian General Electric Co., Toronto. Motors, miscellaneous control equipment, line breaker equipment, motor parts, control equipment, etc.

Canadian National Carbon Co., Toronto. Complete line of carbon brushes, and oxy-acetylene welding and cutting apparatus.

Canadian Steel Foundries, Ltd., Montreal. Electric railway track work.

Canadian Westinghouse Co., Hamilton, Ont. Working models of electrical and air brake equipment, with safety features used on standard safety car, also of supervisory control for automatic substations; load air brake equipment for electric railway service, &c.

Don M. Campbell, Ltd., Preston, Ont. Armature and field coils; overhead material; treated poles.

C.E.A. Carr Co., Toronto. Peter Smith forced ventilator hot air heater.

Cheatham Electric Switching Device Co., Louisville, Kentucky.

Differential Steel Car Co., Findlay, Ohio.

Dominion Insulator & Manufacturing Co., Niagara Falls, Ont. Car equipment, catenary materials, couplers, headlights, line materials, porcelain insulators.

Dominion Wheel & Foundries, Ltd., Toronto. Chilled iron wheels.

English Electric Co., of Canada, Toronto.

Ferranti Meter & Transformer Manufacturing Co., Toronto. Disconnecting switches, meters, outdoor metering equipment, outdoor switching equipment, railway resistance grids and transformers.

Walter M. Graham, Toronto.

Lyman Tube & Supply Co., Montreal, Que. Anti-climbers; automatic compensating lighting fixtures; ball and roller bearings; brakes, car lighting fixtures; car signs; carbon brushes, &c.

Metal & Thermit Corporation, New York, N .Y. Apparatus and material for Thermit rail welding, &c.

Ontario Safety League, Toronto. Automobile wrecked by coming in contact with electric suburban car; photographs of other wrecks &c.

Ottawa Car Manufacturing Co., Ottawa, Ont. Bushings; car trimmings; handbrakes; pressed steel fittings &c.

Railway & Power Engineering Corporation, Toronto, Armature coils; automatic window cleaners; commutators; couplers; door and step mechanisms, &c.

Sarnia Bridge Co., Sarnia, Ont. International twine tie; steel curbing angles.

United States Steel Products, New York. Electrical wires; rail bonds; rails; special track work; steel axles, ties and wheels

Witherow Steel Co., Pittsburgh, Pa. Rolled tie rods.

Chas. S. Wright Co., Toronto. Buzzer equipment; caps

for conductors and motormen; car curtains, seats, signs and ventilators; electric heaters; line material, etc.

New Officers

Officers were elected as follows:

Officers Elected

Canadian Electric Railway Association

Honorary Council: Thos. Ahearn, president Ottawa Electric Ry.; F. A. Gaby, chief engineer Hydro-electric Power Commission of Ontario; Lt. Col. J. E. Hutcheson, general manager Montreal Tramways Co.; Geo. Kidd, president British Columbia Electric Ry. Co.

President, H. H. Couzens, general manager Toronto Transportation Commission.

Vice President, D. E. Blair, superintendent of rolling stock Montreal Tramways Co.

Treasurer, E. P. Coleman, general manager Dominion Power and Transmission Co.

Executive Committee. The president, the vice-president, the immediate past president (Major F. D. Burpee, manager and director Ottawa Electric Ry.), the treasurer, and G. Gordon Gale, vice-president and general manager Hull Electric Co.; W. S. Hart, treasurer Quebec Railway Light, Heat and Power Co. and vice-president Three Rivers Traction Co.; D. W. Houston, manager Regina Municipal Ry.; C. B. King, manager London Street Ry.; M. W. Kirkwood, general manager Grand Valley Railway and Lake Erie and Northern Ry.; H. K. McLean, superintendent of transportation New Brunswick Power Co.; A. W. McLimont, vice-president and general manager Winnipeg Electric Ry.; W. R. Robertson, general superintendent of railways Hydro-electric Power Commission of Ontario, H. E. Weyman, manager Levis County Ry.; C. L. Wilson, assistant manager Hydro-electric Rys., Toronto and York District.

Auditor, Lt. Col. G. C. Royce, general manager Toronto Suburban Ry.

Radial From Port Credit to Oakville

Representatives of municipalities between Toronto and Oakville met at Oakville, Ont., in April and passed resolutions favorable to the construction of an electric railway to be operated by the Hydro Electric Power Commission of Ontario, under the act of 1922. Since then the Ontario Government has passed two orders in council dealing with the matter. The first authorizes the construction of a line from Toronto to Port Credit, and the second authorizes the construction of a line from Port Credit to Oakville, at an estimated cost of $1,065,667. A report by the Premier recommended that agreements between the Hydro-electric Power Commission of Ontario and the municipalities of Toronto Township, Trafalgar Tp., and the town of Oakville, which authorized the construction of an electric railway within their limits as part of a line from Port Credit to St. Catharines, be approved and the line from Port Credit to Oakville be authorized to be built under the provisions of the 1922 statutes, subject to a new apportionment of cost. The H.E.P.C. of Ontario is authorized to proceed with the construction of the line.

It is reported that the present Toronto-Port Credit line, the old Toronto & York Radial Mimico Division, will not be used in connection with the present project, but that a line will be built on private right of way.

The Hamilton Radial Ry., owned by the Dominion Power & Transportation Co., extends from Oakville to Hamilton, and there might be a possibility of making the projected new line from Toronto connect with it, so as to give a through line to Hamilton.

Geo. M. Wight Leaves Monarch Co.

Mr. G. M. Wight who organized the Monarch Electric Co. Limited, in 1907, and has since been managing director and secretary-treasurer and largest stock-holder, has sold his interests to J. M. Robertson, consulting engineer. Mr. Wight entered the



Geo. M. Wight

electrical business under Mr. Fred Thompson, the chief engineer for Canada of the Thomson Houston Company, and has had a broad experience electrically, mechanically and commercially in the electrical business in Canada and the United States. His friends may look forward to the announcement of a new organization under Mr. Wight's direction.

Many Demands for Hydro in New Brunswick

Appreciation of hydro service continues to develop in New Brunswick. Welsford and Morrisdale have asked for current and the latter place has filed a petition to that effect. A request for hydro has also come from Belyea's Point. The commission's staff are now working on requested extensions of service to the larger villages between St. John and Moncton.

There are now 275 customers being supplied at Westfield and adjacent areas, and a total of 304 applicants including those already connected. Fair Vale has 84 customers and a total of 116 applicants. The Hampton Flour Mill is being supplied with current and 52 customers are being served. The commission is enquiring into the possibility of extending service to Lorneville.

The Sussex service is reported to be very satisfactory, while there has been only one accidental interruption on the Moncton Line in the past six weeks. That was due to the dropping out of a switch, causing trouble for one hour and a half. The defect in the switch has been remedied.

At Musquash, the restoration of the Log Falls and Scott Falls dams is going forward rapidly and concrete is now being poured in both places.



Construction activites at the Grand Discharge, Lake St. John, P.Q.—a downstream view of the cofferdam

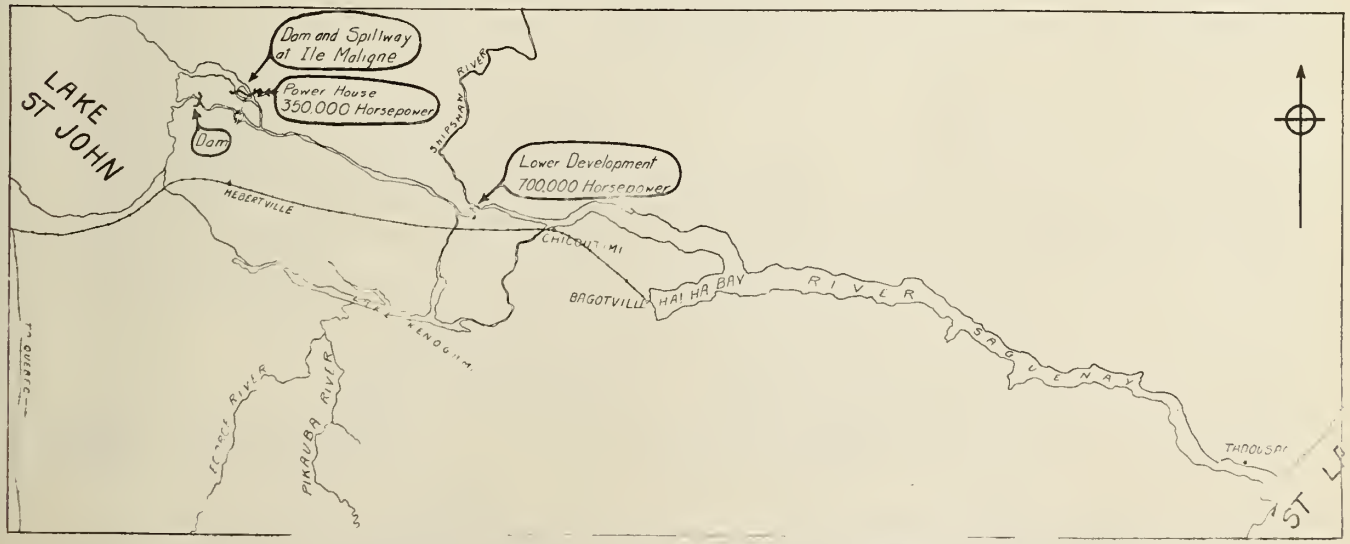
The Backwoods of Quebec Now Alive with Construction Activities

The Quebec Development Company Have Made Tremendous Progress with Their Scheme of Utilizing the Upper Saguenay River—The First Pictures from the Site of the Work

Considerable progress has been made on the work which is being undertaken by the Quebec Development Co., to develop the tremendous power available on the Saguenay River at the Grand Discharge from Lake St. John. In previous issues of Contract Record there have appeared maps showing the location of this site accompanied by short descriptions of the size and nature of the work and the plans for developing the power that is available there.

A brief description here may serve as a summary of what has been said in other issues. The site of the dam is about 25 miles above Chicoutimi, which in turn is about 70 miles from the St. Lawrence River. Lake St. John, which is a big lake, is about 5 miles above the site. The water flows out of Lake St. John by two routes called the Grand Discharge and the Little Discharge, an island called Ile d'Alma separating the two channels. It is the intention of the Quebec Development Co. to place a dam across the Grand Discharge channel at a favorable point near the lower end of Ile Maligne, about 5 miles from the lake. The other channel, called Little Discharge, will also be dammed in order to divert the water into the bigger channel where the power house will be located. It is intended to develop about 390,000 h.p. at this site by means of twelve 30,000 kv.a. units which are to be installed by the Canadian Allis Chalmers Co., and the Canadian Westinghouse Co.

The magnitude of the enterprise demanded fairly extensive preliminary preparations which have been under way for some time. The most important work, apart from the preparations at the site, has been the construction of about 12 miles of railway line through very difficult country. This will be of standard gauge and has been constructed in a most up-to-date way involving heavy rock cuts and adjoining fills as well as three large truss bridges and one long trestle bridge. The railway line will connect at Herbertville



The locations of the works involved in the Quebec Development Co's. project



A general view of the Ile Maligne showing both northerly and southerly channels of the Grand Discharge

with a branch of the Canadian National Railway running from Quebec to Lake St. John.

The cut and fill part and general work is being done by Gagnon and Gagnon, railway contractors, under the direction of their resident manager. All foundations and piers for bridges and trestles were done by Wm. I. Bishop, Ltd., contractors, of Montreal and involved the placing of considerable concrete work under the most trying conditions. It is interesting to note that this part of the work has been successfully completed and now awaits the steel work. Mr. Bishop himself is the consulting engineer for the company.

The steel work for the three truss bridges is being fabricated by the Canadian Bridge Co., at Walkerville, Ont., and is ready to ship as soon as notification is received. There are about 1,200 tons of steel in these three bridges.

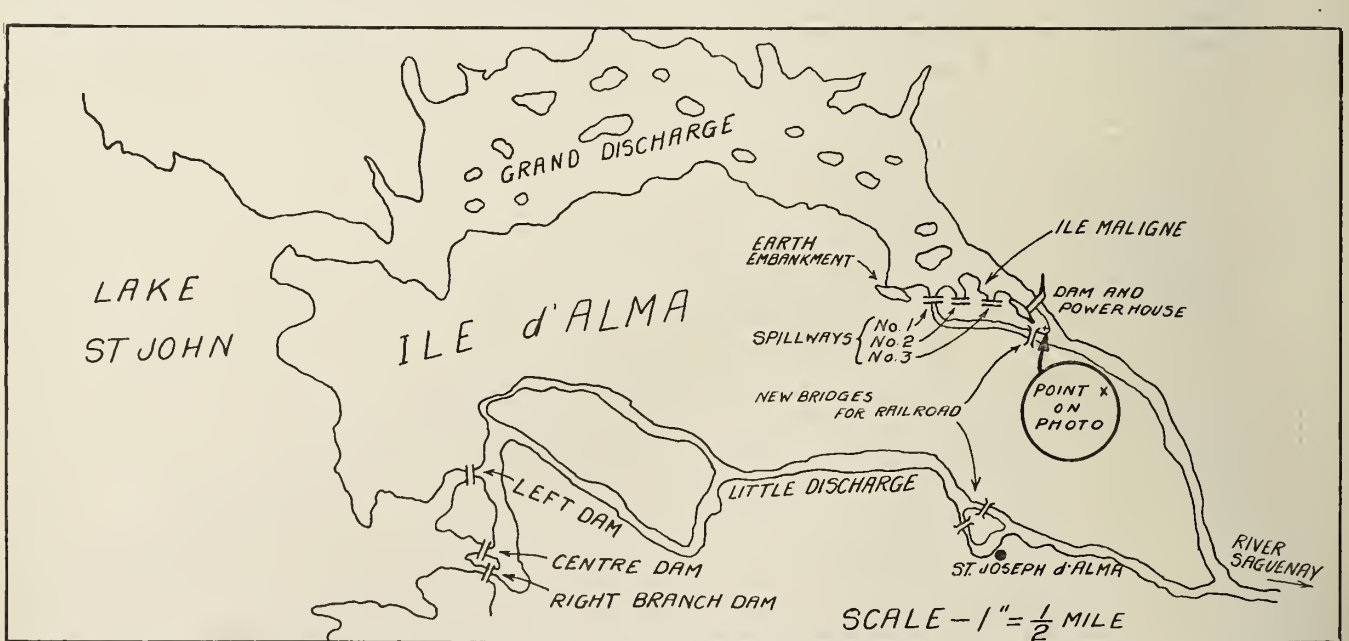
The Dominion Bridge Co. of Lachine P. Q., are supplying about 900 tons of steel work for a high trestle bridge which spans a deep ravine. This bridge will probably be the last to be erected as it is farthest from the existing railway line.

This short stretch of railway will probably cost in the neighborhood of $500,000 or at the unit cost of $40,000 per mile. This is rather higher than usual on account of the nature and contour of the country, being rocky and hilly.

Activities at the Site

The accompanying cut shows a panoramic view of the downstream face of the cofferdam on the Grand Discharge branch. This is to serve to stop the flow of water during the construction of the main concrete dam. It is probably not distinguishable in the cut that the whole cofferdam has been made of timbers that were cut in the immediate neighborhood and used in the dam with a minimum amount of labor spent in trimming and dressing. The cofferdam is practically completely filled with broken stone and boulders and is shown as it will be when performing its duty. Its dimensions are about as follows: length from shore to shore 1,100 ft; height from river bed to top 40 ft.; width on the bottom 40 ft.; width across the top 20 ft.; amount of stone 35,000 cu. yds.; approximate cost in place $250,000.

This project of the Quebec Development Co. is the largest in the province at the present time and is absorbing a big sum of money. It is supplying work to a large number of men in all trades and will no doubt be the means of transforming St. Joseph d'Alma from a small back-woods town to the centre of a thriving community.



General map of the Saguenay and Lake St. John districts showing the location of the power developments on which work is underway

Report of the Committee on Overhead Lines

Favor 3-Phase, 4-Wire Primary Distribution — Transformer Indicators Have Proved Useful — Joint Use of Poles

A. A. DION, Chairman*

Your committee shortly after their appointment last year, circularized Class A. members requesting them to suggest subjects which might be taken up by the Committee with advantage to the members. A number of suggestions were received. Some could not be acted upon. Those to which any study was given are reported below:

1. Comparison between British Columbia Cedar and Eastern Cedar Poles, particularly with reference to rotting of the sap wood of the former.

2. The use of short concrete poles for city distribution systems and methods of climbing the same.

3. The use of vertical secondary distribution on pole wire racks with ground wire on top instead of in the centre as is often done.

4. The use of 3-phase, 4-wire primary distribution and a method of identifying the neutral wire.

5. Treatment of cross-arms and butts of poles.

6. Temperature indicators for transformers.

7. Desirable construction in crossing lines at street corners where the corner has been rounded to a large radius to facilitate turning by motor cars, etc.

8. The desirability of omitting fuses on primaries of transformers, pole types of 25 kv.a. and over.

9. Undetermined or unknown losses on distribution systems and power-factor correction.

10. Uniformity in requirements for crossing railways and public highways, and uniformity in the joint use of poles.

Taking these subjects in the above order:

Cedar Poles

1. The matter of standard specifications for both B. C. and Eastern Cedar Poles is now engaging the attention of a sub-committee of the Canadian Engineering Standards Association and your committee deemed it inadvisable to overlap their work, especially as this is a difficult one and it may be a couple of years before we get a satisfactory specification which will be acceptable to all interested parties; if we ever get that far.

Concrete Poles

2. The matter of using short concrete poles for city distribution was discussed but no conclusion was arrived at. This is a matter which should be taken up by next year's committee. This year's committee had too little information on the subject to base conclusions which would be of any use.

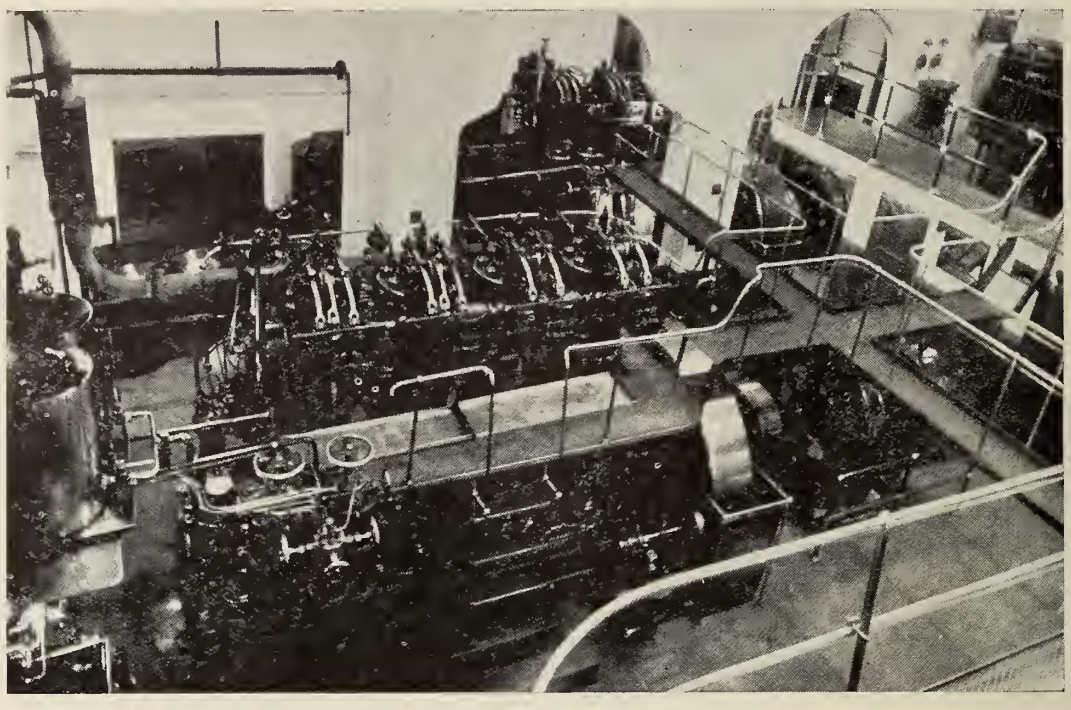
Vertical Secondary Wires

3. Your committee recommends the vertical arrangement of secondary wires on poles by means of racks wherever the vertical space on the poles and other conditions will allow it. The distance between wires should not be less than 8 inches and the practice of placing the neutral wire at the top should be generally adopted. It is the safest position in case of other wires falling upon the secondaries and uniformity will be of great use to linemen in preventing wrong connections.

3-Phase, 4-Wire, 4000 V. Distribution

4. Your committee favours the 3-phase, 4-wire primary distribution at 4000 volts with grounded neutral. In this they are in accord with all the electrical associations that have taken up the subject. It is the coming distribution which thrusts itself upon us owing to the greatly increased loads due to the large current consuming devices that are now being generally used. The company using this system will save copper in new locali-

*Before C. E. A. Convention, Montreal.



Interior of power plant, Vernon, B. C. A Diesel installation

ties and will increase its capacity for future loads on old lines.

This particular voltage has the advantage of being not too high for linemen to work upon live lines while high enough to make very substantial economy in distribution besides in many cases improving the regulation. It is pointed out by those who have had experience that when a system is changed from 2300 volts to 4000 volts with a grounded neutral, many weak points will show up very quickly but after these are properly cleared, the operation is quite as reliable as before.

It is true that with this system every incidental ground on a phase wire means a short-circuit but many operators say they prefer to have faults show up at once through a short circuit than to have a lot of incipient grounds in a 2300 volt system show up in bunches some stormy night. Naturally such a line must be kept clear of trees.

Attention is drawn to the danger which may be encountered if the star-star connection is employed, owing to the presence of the third harmonic. This point requires serious consideration. The success of a common grounded neutral system depends on the ground connections. While your committee feels that these ground connections should be numerous and that a rigid inspection of the same be made at definite intervals, some operators hold that the system should be grounded at the sub-station and nowhere else.

In connecting distribution transformers to such a system it is considered unnecessary to provide double-fuse protection; one fuse only being required on the phase wire to each transformer

The Overhead Lines Committee for next year should continue to gather information, the result of experience, with this system of distribution. They will thus be able to disseminate useful information to the members which will lead to the more general use of this system to the advantage of the companies concerned owing to the relatively low capital investment involved.

There should be a definite place on the pole and cross arm for the neutral wire so that linemen will always know the neutral from its position. Suggestion has been made in some quarters that the neutral sould be designated by a tag on the cross-arm just below the pin or by the use of an insulator different in color; however, since the wrong insulators may easily be used when a lineman runs short of the right kind, your committee favours the position on the pole as the best indication.

Treatment of Poles & Cross-Arms

5. The National Electric Light Association has made such a thorough study of the preservative treatment of wooden poles and cross-arms

and has published in its reports so much information on the subject that it seemed to your committee a waste of time to make any further enquiries; the last reports of the committee of the N.E.L.A. seem to be the last word on the subject.

The consensus of opinion among line superintendents and engineers in the United States seems to be that cross-arms if made of the proper wood will last longer if not painted. The paint, while not adequately keeping out the moisture, afterwards is effective in preventing quick drying out.

Temperature Indicators

6. Some study was given to temperature Indicators for transformers such as semaphores, thermometers, etc.,—not very much information could be obtained from people who had used them, but it is the opinion of your committee that these indicators have already been of considerable service to the industry although they all have a serious defect in that they can only give you the temperature of the oil, and the ratio between the hottest spot in a transformer and the oil is anything but constant or uniform, and in the case of a heavy load applied for a short time, the thermometer would give no adequate indication of what had taken place.

This is a subject that deserves more consideration and should be taken up by next year's Committee on Overhead Lines. It has been said at one of the meetings of the Overhead System Committee of the N.E.L.A. that the trouble with the companies was that they were not burning out enough transformers; meaning that there was installed in most cases an excess of transformer capacity over actual requirements and that therefore what we needed was a means of finding that out readily rather than occasionally discovering a transformer that was overloaded. It is the opinion of your Committee that all available means should be employed to ascertain the ratio between demand and installed capacity in order that the investment in transformers might be reduced and transformers in use might operate more economically.

Lines at Street Corners

7. A questionnaire on this subject was sent out and brought in a few answers. Several means of getting over the difficulty were suggested but your committee did not consider the matter of sufficient importance nor is there enough unanimity of opinion as to how it should be handled to make any report upon it

Non-Fusing of Large Transformers

8. The consensus of opinion of your committee and of those who replied to the committee's questionnaire on the subject was that it would be inadvisable to omit fuses even on transformers of large size because where transformers were banked it was necessary to have selective action in order that one defective transformer might not cause the burn-out of the whole bank. It was pointed out however that in underground work, transformers installed below the ground, fuses had to be omitted because they had to be placed in water-tight containers, leaving no vent for expulsion of gases. What seems to be needed, in the opinion of your committee, is a better fuse-box and better fuses for transformers of large size or operating on high voltages.

Undetermined Losses in Distribution

9. It has been suggested to your committee that considerable economy might be effected by careful survey of conditions on our lines. We have mentioned above the matter of over-installation of transformers. There are other losses which are undetermined, sometimes unknown, which it might be possible and to our advantage to eliminate. There are probably cases where it might pay to take steps to improve the power-factor. Without going into any details, the plea of your committee is for activity in finding out where preventable losses are and taking steps to eliminate them. Some work on this subject might be taken up by next year's committee.

Crossings and Joint Use of Poles

10. Regarding uniformity in requirements for



Albert Senecal, who was awarded the Julian C. Smith Life Saving Medal at the recent C.E.A Convention.

crossing railways; this is a matter for the Board of Railway Commissioners of Canada. There is at present a set of rules governing this which was submitted to this association before it was adopted. If these rules are not satisfactory or they are not being observed by any of the railways, the company suffering therefrom should take it up with the Railway Commission. It has been stated by one company that the Canadian National Railways were imposing unnecessary conditions upon them when it was necessary to cross the railway line. I should think any railway in Canada government-owned or not, may be compelled to carry out the regulations of the Dominion Railway Commission.

As to uniformity in joint use of poles. We note that the Bell Telephone Company of Canada is anxious to bring about such a condition. It can only be done however by conference between all the interested parties. The representative of the Bell Telephone Company on your committee was willing that his company should go in such a conference. Your committee, through its chairman, addressed the president of the Municipal Association in Ontario and the reply was that they could do nothing this year but the matter could be taken up at their next annual meeting and representatives might be named to co-operate with representatives of other interests on this subject.

The Overhead Systems Committee of the N.E.L.A. has submitted this year a revision in part of the "Overhead Lines Construction Handbook" covering materials and methods of construction. This will be tentative for this year and as it stands or as further revised through criticism of the members will be finally recommended next year. It behoves the members of this Association to read this report carefully and to instruct the C. E. A. representative on the N.E.L.A. committee as to any changes which they may think desirable to make.

We can make no marked progress except when notable improvements are made in our power supply. Thus the power of slaves gave us one type of civilization; draft animals, a second, steam engines, a third; and so we have advanced, step by step, until we are today living in an age characterized by electric power.—Guy E. Tripp.

E. E. Carpenter, Chief Engineer B. C. E. R. Co.

Mr. E. E. Carpenter, member of the American Society of Civil Engineers and of the American Association of Engineers and a member of the firm of Baker & Carpenter of San Francisco, has been appointed chief electrical engineer for the British Columbia Electric Railway Company, Vancouver, B.C., and has already taken up his new duties. Mr. Carpenter is a graduate in civil engineering, Stanford University, 1898. He followed railway engineering for some seven years, successfully filling positions of assistant engineer, Ray Mining Co., Kelvin, Arizona; assistant engineer M. of W. Department, Southern Pacific Railway Company, Sacramento, California; assistant engineer S. P. Ry. Co., location and construction, Bakersfield, California; assistant engineer, location surveys, Stanislaus River Power Development Project; locating engineer, Butte County Railway, Chico, California; locating engineer, Western Pacific Ry. Co.; consulting locating engineer, Nevada Northern Railway, Ely, Navada. He was chief construction engineer for Sanderson & Porter in the installation of Stanislaus River Power Development of the Sierra and San Francisco Power Company; chief engineer for Sanderson & Porter in charge of design and construction of power development installation 5,000 h.p. initial, for the British Columbia Electric Railway Company at Jordan River, Vancouver Island; and on Sooke Lake Water Supply, city of Victoria, B.C. He was chief civil engineer, Panama-Pacific International Exposition for three years being in responsible charge of design and execution of all cival engineering work for the exposition. Later he was a member of the firm of Baker and Carpenter, engineers, San Francisco and engaged in general consulting and executive engineering practice. Projects undertaken by this firm included a ship building project at Raymond, Washington, and the building of Stanford Stadium, Stanford University, California, seating capacity 60,000; and design and construction of the California Memorial Stadium, seating capacity 72,000.

The 1922 report of the Department of Telephones of Saskatchewan shows that considerable construction work was completed in that year. This included the opening of 23 toll offices, 9 new exchanges, 323 miles of pole mileage and 785 miles of wire mileage.

Selecting the Right Motor

Methods of Torque Measurement – Horsepower Requirements of Pumps—Calculations for Fans

By H. E. STAFFORD*

Where it is desired to find the horse power requirements of a motor from the torque developed, the method shown in Fig. 6 is used. The motor is belt connected to the driven load and a clamp fastened to the belt, as shown. A spring balance is attached to the belt and held parallel to it, the other end being fastened to an eye bolt in the floor. The torque is expressed in pounds, on the spring balance, at the distance L on the driven pulley, and by using the formula Horsepower = (2 x 3.14 x torque x r.p.m.) ÷ 33000, the actual horsepower is obtained. The r.p.m. given in the formula is the speed of the driven pulley. An example is as follows:—A motor with a speed of 1200 r.p.m. is under test. The driven pulley is 20 inches in radius or the distance L and the reading of the scale is 120 lbs. What is the horsepower of the motor?

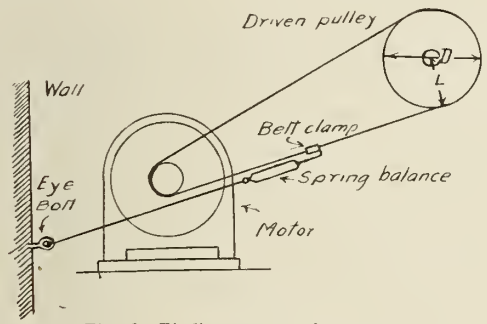


Fig. 6—Finding torque of a motor

The torque = 120 x 20/12 = 200 lbs. at one foot radius, and the h.p. = (2 x 3.14 x 200 x 1200) ÷ 33000 = 68.5 h.p.

Measuring Torque at the Motor Coupling

For this test, the arrangement is shown in Fig. 7. A shaft is bolted rigidly to the coupling and a spring balance fastened to the other end and to the floor. The torque is then figured as the reading of the spring balance at the distance L, and by using the formula given above, the actual horse power can be figured. This last method is a representation of the Prony Brake Method.

*Electrical Engineer, Provincial Paper Mills, Port Arthur.

The Horse Power Required of a Given Motor

As a general rule, machine manufacturers test the load requirements of their various machines before putting them on the market, so that in ordering a given machine, the size of motor is specified. It often happens however,

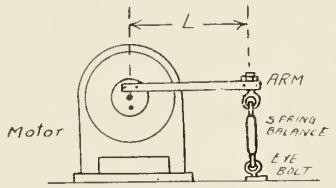


Fig. 7—Another method of measuring torque

that they allow too much leeway with the result that when a given machine is installed it is found that the load is less than the output of the motor.

There are certain cases however, where the actual load conditions are not known and in such a case it is necessary to either rent a motor or use some other prime mover as a test of the load. Owing to the fact that tests have been made from time to time on the types of machinery now in use, tables and formulae have been found whereby it is a simple matter to figure the horse power requirements, as for instance, of pumps, fans, conveyors, etc.; where the load varies with the head and delivery of a pump, the volume of air discharged by a fan, or the length and speed, in feet per min., of a conveyor.

Centrifugal Pumps

To find the horsepower requirements of centrifugal pumps, the following formula is used, H.p. = (g.p.m. x 8.33 x H) ÷ (33000 x E)

Where H.p. = actual horse power required; g.p.m. = gallons per min.; 8.33 = weight of one gallon of water, in lbs.; H = head in feet and E = efficiency.

Example.—A pump delivers 500 gals. per

min. against a head of 40 feet. What power is required to drive the pump, if its efficiency is 60 per cent?

Solution, H.p. = (500 x 8.33 x 40) ÷ 33000 x .60)= 8.4 h.p.

A centrifugal pump acts in the following manner. If the head is decreased, the load on the motor is increased and vice versa. The reason the centrifugal pump increases the power as the head decreases is primarily due to an increase in volume of water delivered and also to the drop in the efficiency. Take the last example for instance, and decrease the head to 30 feet. The efficiency will probably drop to 40 per cent., and the horse power required will increase to—

Table 3—Constants for Centrifugal Fans

Type of Fan	K
Paddle wheel with 6 to 10 straight blades and W=0.45D	0.0060
Steel pressure with 24 Backward Curved Blades and W=0.15D	0.0050
Slow Speed conveying with 18 Forward Curved Blades and W=0.25D	0.0100
Single Inlet Multihlade—Drum with 60 Narrow Curved Blades Inclined Forward and W=0.50D	0.0350
Double Inlet Multiblade—Drum with 60 Narrow Curved Blades Inclined Forward and W=0.25D	0.0250
Double Inlet Multiblade—Drum with 60 Narrow Curved Blades Inclined Forward and W=0.50D	0.0400
Double Inlet Multiblade—Drum with 60 Narrow Curved Blades Inclined Forward and W=1.00D	0.0350

H.p. = (500 x 8.33 x 30) ÷ (33000 x .40) = 9.46 h.p.

This is not always the case however, as most pump manufacturers design their pumps so that the load decreases with a decrease in head after the maximum load is reached.

Horse Power Required for Fans and Blowers

The horse power required for a fan or blower depends on the type of fan or blower. There are three types, namely, centrifugal fans, propellor fans, and positive fans, and each has its own formula for horse power.

For finding the horse power of a centrifugal fan, the following formula is used:

$$\text{Horsepower} = K \times \left(\frac{T}{1000}\right)^3 \times D \times W \left(\frac{w}{0.075}\right)$$

where K is a constant depending on the design of the fan, as found in Table 3

T = peripheral velocity of the outside diameter of blades, in feet per min.

D = mean diameter of fan wheel, in feet.

W = mean width of fan wheel, in feet.

w = absolute density of gas handled, in lbs. per cu. feet, as found in Table 4.

0.075 = weight of standard air at 65 degrees Fahr., in lbs. per cu. feet.

Example.—What size motor is required to drive a centrifugal fan with 6 paddle wheel blades, the length of blade from the center of the hub is 3 feet and the mean width of blade is 12 inches; the fan is blowing sulphur gas at the rate of 750 r.p.m?

Solution.—Since the speed is 750 r.p.m., the speed of the outside diam. of blade or peripheral

Table 4—Density and Weight of Gases

Name	Specific Gravity 32° F	in lbs. per cu. ft
Air	.00129	.08034
Carbon Dioxide	.00197	.12269
Carbon Monoxide	.00125	.07785
Chlorine	.00322	.20054
Hydrogen	.00009	.00560
Nitrogen	.00125	.07785
Oxygen	.00143	.08906
Sulphur Dioxide	.00292	.18185

Weight in lbs. per cu. ft=Specific gravity × 62.28

velocity = 750 x 3.1416 x 6 = 14136 feet per min.

K from the table = .0060

$$\text{Horsepower} = .0060 \times \left(\frac{14136}{1000}\right)^3 \times 6 \times 1 \times \left(\frac{.18185}{.075}\right) = 246$$

For finding the horsepower of a propellor fan or a positive fan, the following formula is used:

$$\text{Horsepower} = K' \left(\frac{T}{1000}\right)^3 \times A \times \left(\frac{w}{0.075}\right)$$

where K' = constant taken from Table 5

A = gross area of wheel, in square feet, and all other symbols have the same meaning as before.

Example.—How much power is required to drive a propellor fan having 4 blades, the area of each blade is 2 sq. feet and the length of blade is 2 feet from the center of hub; if the fan revolves at 1000 r.p.m.? The fan is blowing chlorine gas.

Solution.—The peripheral speed of the fan = 1000 x 3.1416 x 4 = 12565 feet per min.

K' from table 34 = .0012

$$\text{Horsepower} = .0012 \times \left(\frac{12565}{1000}\right)^3 \times 4 \times 2 \times \left(\frac{.200}{.075}\right) = 50.6$$

Thus from the foregoing; for a given fan size, piping system and air density,

(1) The horse power of any fan or blower varies as the cube of the speed if the discharge orifice remains the same size.

(2) The horse power varies directly with the density of the gas being blown.

(3) The horse power varies as the pressure x 3 ÷ 2.

(4) The capacity varies directly as the speed.

(5) The velocity varies as the speed or capacity.

(6) The pressure varies as the square of the speed.

Where the pressure is constant,

(7) The capacity and horse power vary as the square of the fan size.

(8) The speed varies inversely as the fan size.

(9) The speed, capacity and horse power vary as the square root of the absolute temperature.

The main difference between a centrifugal fan and a propellor fan is, that with the centrifugal fan, the power decreases as the discharge orifice is decreased, if the speed remains constant; while with the propellor type, the power increases as the discharge orifice is decreased, if the speed remains constant. Thus the two types are opposite in their effect on the power consumption.

Table 5—Constants for Propeller Fans

Type of Fan	K' Weight
Sturtevant Propeller	0.0006
Multiblade Disc	0.0012
Blackman Propeller	0.0012
Davidson Propeller	0.0015

Blowers

A positive blower acts the same as a propellor fan, since the clearance between the impellor and casing is very small. The power taken on the start of a fan is very small but increases rapidly as the speed increases and in this respect only, acts the same as a centrifugal fan. The increase of power due to an increase of speed is shown in the following example.

Example.—A fan travelling 250 r.p.m. requires 10 h.p. What power will be required if the speed is increased to 750 r.p.m.?

Where the volume of air is known, the following data and formula may be used. Each cu. foot of air per min. moved against a total pressure of one inch of water, equivalent to .577 oz. per sq. inch or 5.19 lbs. per sq. foot, represents the expenditure of 5.19 foot lbs. of work. Therefore the horsepower expended =

5.19 ÷ 33000 = .000157 h.p. per cu. foot of air.

In other words, it requires 1 h.p. to move 6370 cu. feet of air per min. against 1 inch of water, with 100 per cent. efficiency, since 1 ÷ .000157= 6370 cu. ft. of air per min. or a.p.m.

The formula for horse power then is

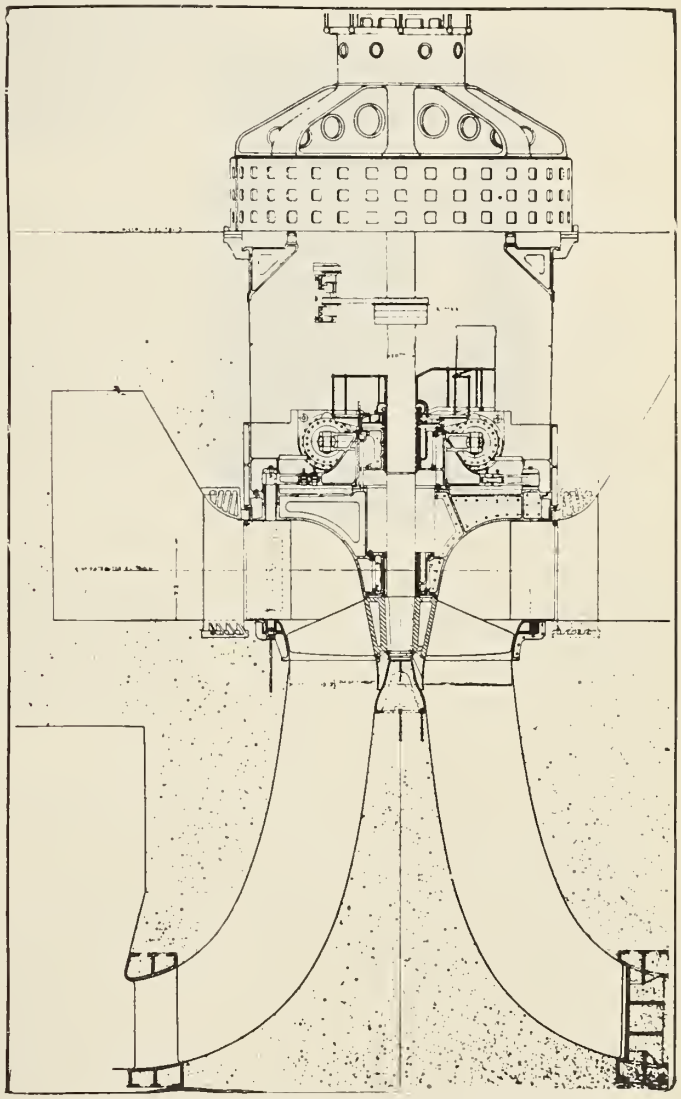
Horsepower = (a.p.m. x .000157 x total pressure in inches) ÷ (total efficiency)

The above formula applies to propellor and positive fans; while for fans with straight blades, the total pressure is doubled and the formula is

Horsepower = (a.p.m. x .000157 x total pressure in inches x 2) ÷ (total efficiency)

Turbines for St. Maurice Power Co.

Mention was made in these columns recently of the fact that the St. Maurice Power Company were making rapid headway with their plant at La Gabelle, Quebec. It is now our pleasure to reproduce the accompanying illustration, showing a partial cross-section of one



of the units, through the kindness of the Dominion Engineering Works, who are manufacturing the turbines. The contract includes four turbines, all 30,000 horse power, I. P. Morris type. This large order is a reflection of the hydro-electric activity that is taking place all over Canada, a fact that would seem to presage intense industrial activity.

$15,000,000 Spent for Railway Electrification

In order to increase its traffic capacity and to secure important operating economies, the Virginian Railway has decided to electrify 213 miles of its track lying between Roanoke, Va., and Mullens, West Virginia. Ths undertaking will involve the expenditure of $15,000,000. The order for the electric locomotives, power house, transformer stations, and other apparatus has been awarded to the Westinghouse Electric and Manufacturing Company and forms the largest railroad electrification contract ever placed. The divisions to be electrified crosses the Allegheny Mountains. The alternating current, single phase system will be used.



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N. C. Dusty to Home Appliances, Ltd.

Mr. N. C. Dusty is taking charge of the plant of the Home Appliances Mfg. Co. Ltd. Mr. Dusty was previously with the Willys-Overland Company.

Kitchener to Buy Railway

A by-law to purchase the radial line of the Waterloo, Wellington Railway Company between Kitchener and Bridgeport, Ont., will be submitted to the ratepayers of the city on August 18 as a result of a decision of the City Council acting upon a petition signed by four hundred ratepayers.

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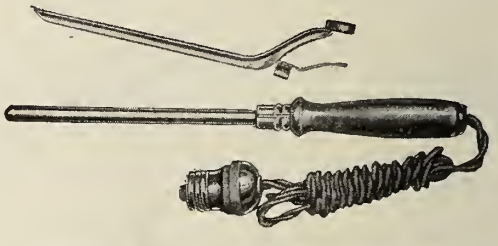
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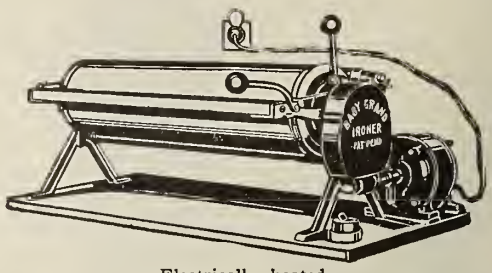
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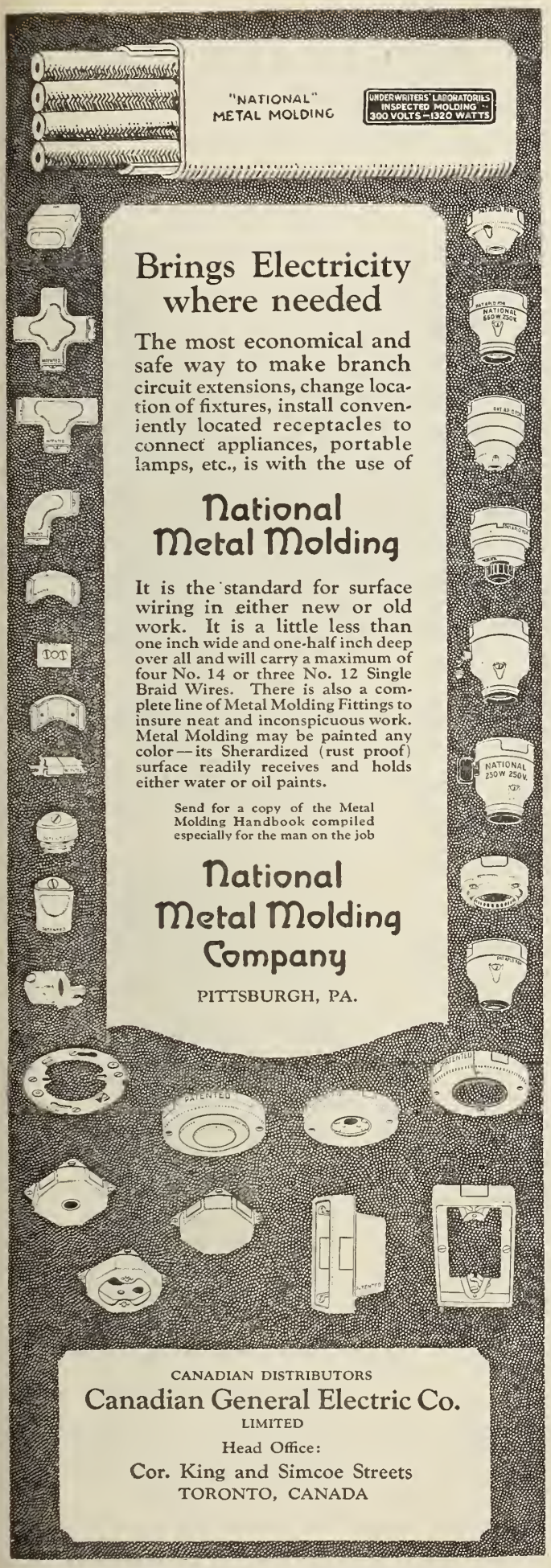
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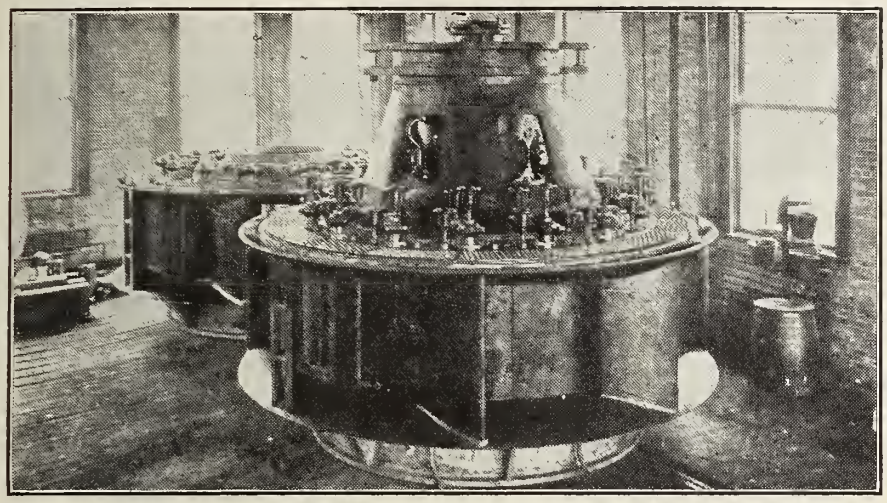
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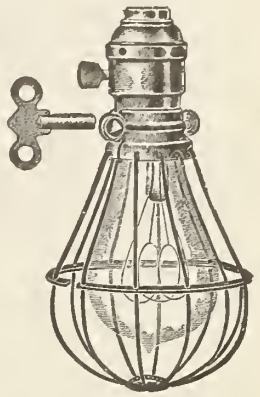
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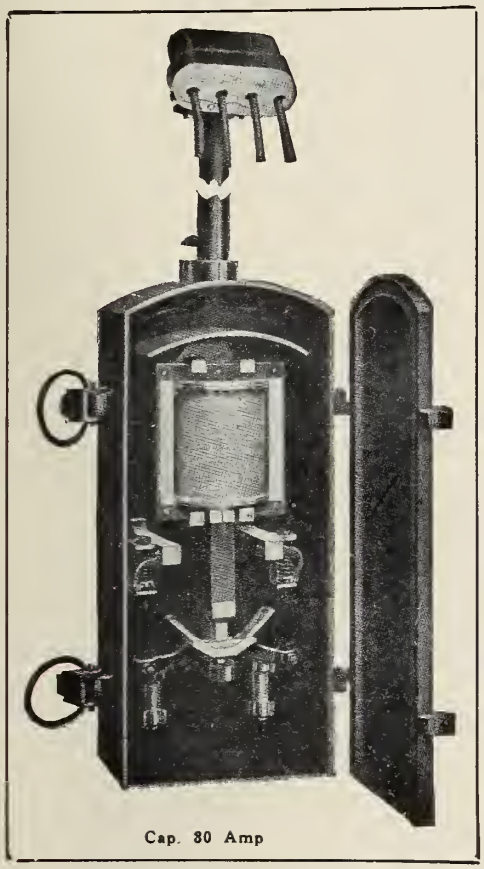


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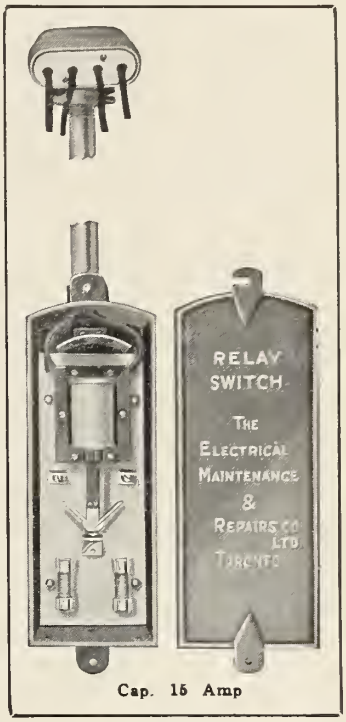
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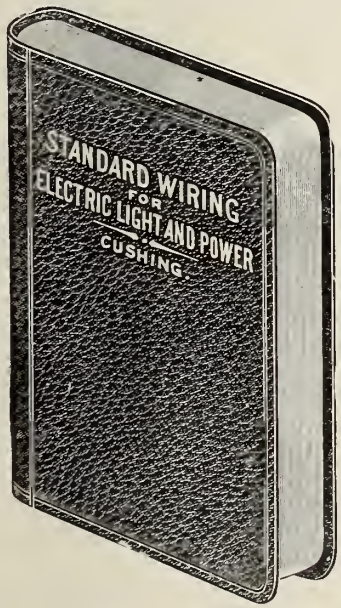
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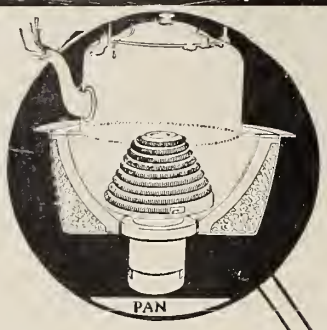
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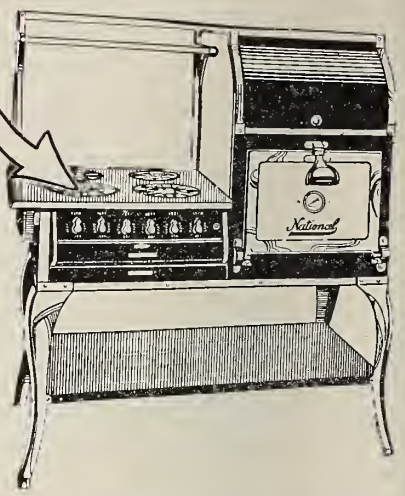
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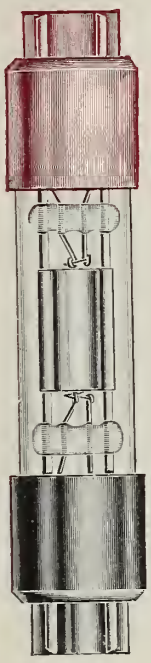
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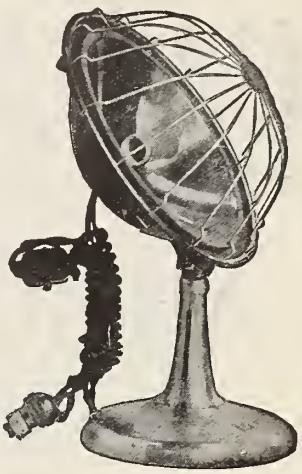
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Wires & Cables
Fire Alarm Systems
Radio Sending and receiving Equipment

DISTRIBUTING
Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

Five FREE Premiums

To Dealers Pushing

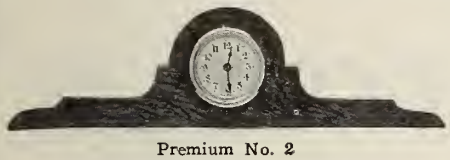
Majestic Heaters



Here's an offer never before made in the Electrical Goods trade!

In addition to the splendid profits always pertaining to the sale of Majestic Electric Heaters, we are, this Fall, going to bonus live dealers with useful premiums that will delight their wives and be beneficial to the whole household.

Three of our heaters are now on the market—No. 8 two-coil "Majestic", with a larger reflector; No. 7, the single-coil favorite, which will be considered the standard in our premium offer and the new "Little Canadian Beauty", a lower-priced Heater that is sure to prove immensely popular.

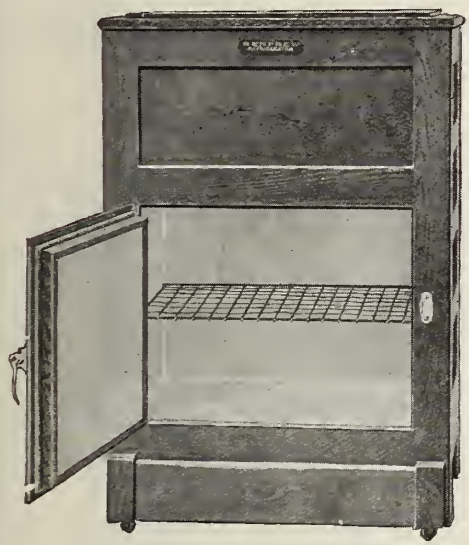


Premium No. 2
Genuine Westclox Cabinet Clock of guaranteed goodness

Choice Premiums

All three types of Majestics count for premiums. A No. 7 is reckoned as **one** Heater. A No. 8 will be equal to one and one-half Heaters and the new No. 6 type as three-quarters of a Heater. Thus, the dealer can meet **all** Heater demands and win one or more of the five valuable premiums. These will be awarded thus:

No. of Sales	Premium	Value
20 Heaters	Kitchen Stool	$ 4.00
25 "	Cabinet Clock	$ 5.00
50 "	Porcelain Table	14.50
75 "	Refrigerator	20.00
100 "	Porcelain Table Cabinet	27.00



Premium No. 4
It requires only seventy-five Heater sales to win this fine Refrigerator, Oak or White Enamel finish

Well Worth Winning

Every one of these Free Premiums is worth winning. The glossy white enamelled Kitchen Stool has a score of uses that your wife will appreciate. The reliable Cabinet Clock is needed every day in the kitchen. The final touch to a cleanly, convenient kitchen is the lovely Porcelain-Topped Table. Every home-maker will appreciate the Refrigerator given as the fourth premium and the Table Cabinet is a beauty!

Get In At The Start

You can win a premium easily. For example, the twenty-Heater group means only eight small ones, eight single-coil and four two-coil Majestics. A little energetic "pushing" and the first premium is yours. All sales up to December 31st count and the premiums will then be awarded at the option of the dealer. That means that fifty Heaters entitles the dealer to either the Porcelain Table or both Kitchen Stool and Clock. Sell seventy-five Heaters and you have your choice of the Refrigerator or the Table and Clock (or Stool). Selling one hundred Heaters gives you either the Cabinet or such other premiums as represent one hundred sales.

Get in at the start and receive your full share of this Fall's big business in Majestic Heaters. Our extensive newspaper and magazine advertising will create hundreds of new prospects for "Majestics." Anticipate your Fall and Winter requirements. Estimate your needs liberally—and order **NOW!**

RENFREW ELECTRIC PRODUCTS, LIMITED

General Sales Office: 29 Richmond Street West, Toronto.
Factories: Renfrew, Ont.



Premiums Nos. 1 and 3
Lovely Porcelain-Topped Table and Enamelled Chair. Ideal for the kitchen. Selling Seventy Heaters wins them both.



Premium No. 5
Sell one hundred Majestic Heaters and present this beautiful Porcelain Table Cabinet to your wife!

CANADIAN PRODUCTS

ARMOURED CONDUCTORS

TWIN AND THREE-CONDUCTOR
IN SIZES, NO. 14, 12, 10, 8 AND 6

FLEXIBLE STEEL CONDUIT

3/8", 1/2", and 3/4"

Look for the identification mark (L N) stamped every two and a half inches on all our steel products.

NON-METALLIC FLEXIBLE CONDUIT

TRADE MARK Loomduct REGISTERED

A single wall Conduit of unusual flexibility

SIZES

1/4", 3/8"
1/2", 5/8"
3/4" & 1"

TRADE MARK Insuladuct REGISTERED

A double wall Conduit that has stood the test of time

FIBRE TWINES AND CORDAGE

Made from the highest grade Kraft and suitable for the manufacturing of all products in which paper is used

TORONTO
Robert G. Ross
701 Eastern Ave.
Telephone
Gerrard 467

The L. & N. Co. Limited
ST. JOHNS, QUE.

WINNIPEG
Fred E. Garrett & Co.
607 Union Trust Building



DIAMOND FIBRE PULLEYS

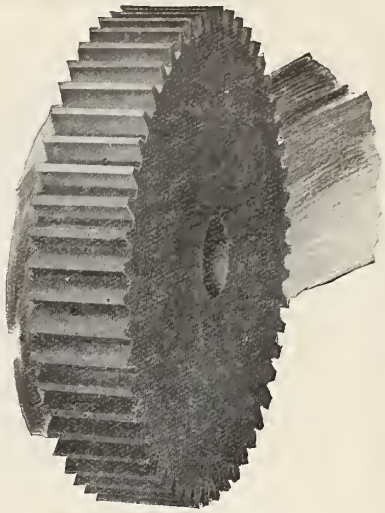
Wood pulleys split; metal pulleys crack; paper pulleys absorb oil. Diamond Fibre pulleys do none of these things and in addition give greater traction, more power, less slipping—hence their growing popularity in the electrical and mechanical fields.

We make them—to your own specifications if desired.

Diamond·F

Radio Panels made of Condensite Celoron bear the approval of the leading experts in the field. Send for our booklet.

Condensite Celoron and Diamond Fibre are made in sheets, rods and tubes in varying sizes and thicknesses. From these they are made into the countless products for which they are so ideally suited.



WATERPROOF NOISELESS GEARS

Condensite Celoron gears and pinions eliminate the distracting clash of metal on metal, reduce the mechanical wear and tear, besides making for economy and efficiency in production.

Diamond State Fibre Company of Canada Limited

Toronto - Canada

Thomson Electric Motors

in use in many of the largest manufacturing plants in Canada

are built by

FRED THOMSON CO., LIMITED

ELECTRICAL ENGINEERS

7-13 ST. GENEVIEVE STREET MONTREAL



Misunderstandings — That's Why School Boys Fight. —

HOW many more friends would **you** have to-day if there was no such thing as misunderstandings? Isn't it a fact that a misunderstanding can estrange two parties all too quickly.

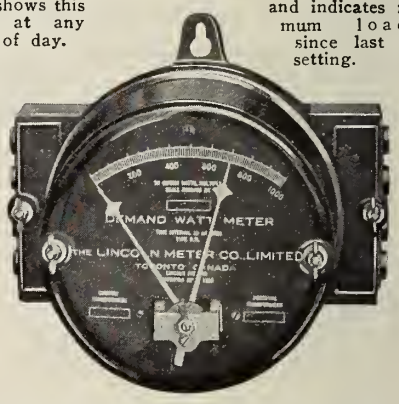
Consider the school boys, fighting over "something" someone said or is supposed to have done. Consider also the gigantic problem which misunderstandings cause in the business world today.

For example, misunderstandings **may** arise when a current consumer's demand is neglected or estimated. If he once **gets an idea** that he is being penalized for the bad power factor of his neighbor, that idea may spread to where it becomes an injustice to you.

The Lincoln Demand Meter makes impossible these misunderstandings. It **measures** demand just as accurately as a watt hour meter measures energy. You bill on a 100% **measured** basis—you erase the human element in the calculation of your bills.

Hand now on left varies with load and shows this load at any time of day.

Hand now on right moves only to right and indicates **maximum** load since last resetting.

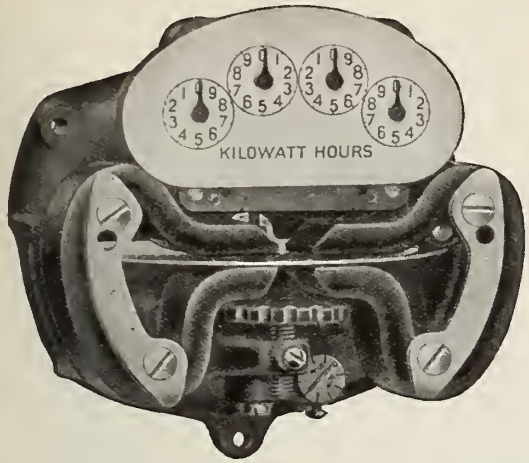


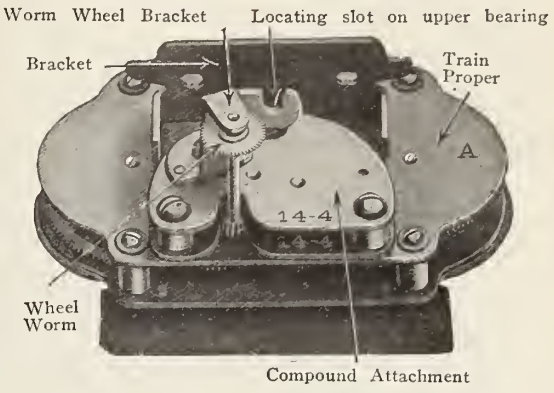
Write for the section or (sections) of the Lincoln Meter catalog which interests you. SECTION I is a non-technical treatise on why demand should be measured; SECTION II the technical treatise on demand measurement; SECTION III, Installation; SECTION IV, the Lincoln Graphic Demand Meter; SECTION V, the Lincoln method of Volt-Ampere Demand Measurement (Power Factor recognition); and SECTION VI, the Lincoln Split Core Transformer and Demand Ammeter.

The Lincoln Meter Co., Limited
72-74 Stafford Street, Toronto, Canada
Cable "Meters" Toronto. Phone Adelaide 3969

The Lincoln Demand Meter is available with the Sangamo energy Meter—sold as the **Lincoln-Sangamo** DEMAND ENERGY **meter**

Lincoln MAXIMUM DEMAND meter





Sangamo Meter Trains are Built Right

THE recording train of a Watthour meter **must** be built right or meter accuracy is impossible.

The recording trains of Sangamo meters are built right. Friction in the train is reduced to a minimum through accurate meshing of gears and pinions scientifically cut one tooth at a time like all high-grade gears. Corrosion of parts is avoided by using nickel plated brass throughout. In fact the Type "H" meter will show no difference in speed on a very light load whether recording train is on or off.

With Sangamo Meters the recording train **cannot** be attached incorrectly. The entire mechanism is carried on a rigidly formed and swaged brass bracket, accurately located by two dowel pins set in the top face of the grid. This mechanism is held to the grid by two screws very easily accessible from the top when it is desirable to remove the train.

The Sangamo Energy Meter is available with the Lincoln Demand Meter sold as the **Lincoln-Sangamo meter**

A slot in the worm wheel bracket which engages the upper bearing screw itself insures a positive position and correctly maintained mesh between the worm of the moving element and the worm wheel of the train.

The same careful design which insures accurate performance of the train is carried out in all other parts of Type "H" Meters. Our nearest agents will be glad to give you details.

Write us to-day for bulletin 5518 fully describing Type "H" alternating current Watthour meters.

Sangamo Electric Company of Canada, Limited

Factory: TORONTO **Head Sales Office: MONTREAL**

2073

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Rubber Covered Wires and Cables

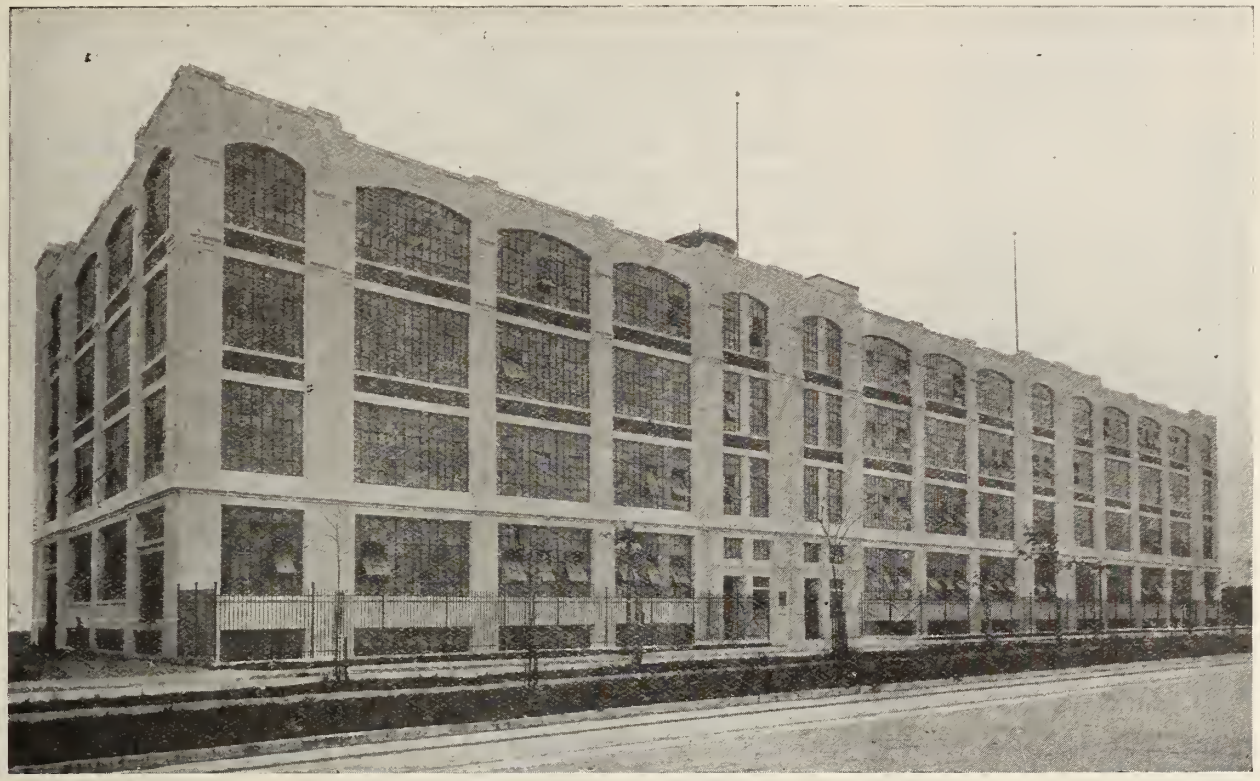
FOR POWER, LIGHT AND TELEPHONE WORK

Incandescent Lamp Cord, Flexible Switchboard Cables, Special Cords and Cables for all kinds of Electrical Work.

Prompt Shipments from Canadian Factory.

BOSTON INSULATED WIRE & CABLE CO., Limited

Canadian Office and Factory, HAMILTON, ONT.



A Galvaduct Building
American Can Company, Limited, Plant, Montreal, Que.
Canadian Comstock Company, Electrical Contractors

"GALVADUCT"

"Galvaduct"

The most perfect interior construction conduit on the market.

Recognized as the standard of high quality.

Always specify Galvaduct or Loricated.

Conduits Company Limited

Head Offices and Factory
Toronto

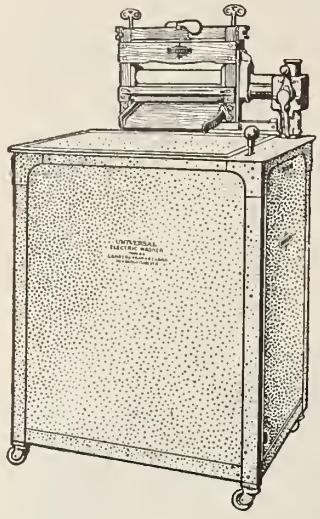
Western Sales Offices:
Winnipeg and Vancouver

"Loricated"

A high-class interior construction conduit of the enamelled type, proof against acid or other corrosive agents.

If your jobber cannot supply you—write us.

"LORICATED"



UNIVERSAL

Manufactured by Landers, Frary and Clark

The **UNIVERSAL** Electric Washer is another product worthy of the reputation of the manufacturer back of the name.

GEARS—of cut steel—fully enclosed—automobile construction—no belts or chains. Automatic safety clutch in drive shaft.

WRINGER—Non-sagging—swinging—reverisble.

CYLINDER—zinc—durable and sanitary.

TUB—galvanized or copper with settling zone.

FINISH—A beautiful blue.

Write us for our proposition.

Machines always in stock in Winnipeg.

GREAT WEST ELECTRIC CO., LIMITED

87 KING ST., WINNIPEG

Made in Canada Conduit

Electrical Wiring Made Safe

Approved by the Hydro-Electric Commission of Ontario
Labelled under supervision of Underwriters' Laboratories

XCELADUCT

GALVANIZED

For All Electrical Installations

Manufactured by

National Conduit Co., Limited

Toronto

EDISON MAZDA LAMPS

Will be Manufactured at

The Canadian National Exhibition

Hundreds of Thousands Will See Them Being Made

THE Canadian National Exhibition is visited every year by over a million people.

Practically everyone, attending the Annual Fair, visits the Process Building, which this year, will contain a model Lamp Factory complete in every detail. Here you will be able to watch Edison Mazda Lamps being manufactured.

Few articles are so interesting to watch, during the different manufacturing operations, as an Edison Mazda Lamp. For this reason alone, the advertising value of the exhibit will be enormous. It will many times over pay you to visit our Model Factory and in addition feature Edison Mazda Lamps in your store during the two weeks of the Exhibition and immediately after.

Coupled with this exhibit we will launch in September the most elaborate Advertising Campaign we have yet attempted. Edison Mazda, already a household word, will be so popularized to the people of the Dominion that the sales resistance will be practically nil.

"Made in Canada" by

EDISON LAMP WORKS

of

Canadian General Electric Co. Limited

Johnnie

Hotpoint

Says

"See Me At The Canadian National Exhibition"

OUR friend Johnnie will have a booth in the Electrical Building, just opposite the Art Gallery and also in the "Made in Stratford Exhibit" in the new Arena. He will be more than pleased to see any and everyone connected with the Electrical Industry. Hotpoint "Servants for the Home" will be displayed and a cordial invitation is extended to all dealers visiting the Exhibition.

Be Sure That Your Stock of Hedlite Heaters is Ready

We can make prompt shipment from stock, and strongly advise that orders be placed immediately, so that you may take advantage of the first cool spell.

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited

The Cool Fall Evenings Mean Business For You



THE Hotpoint Hedlite Heater can pave the way for a series of sales. An auxiliary heating unit is necessary in the majority of homes during the fall, before it is necessary to light the furnace. The Hedlite Heater offers the best solution to this problem, but in order to secure this business you will have to let your customers know that you can supply them. The best way to do this is to feature Hedlite Heaters in your window displays

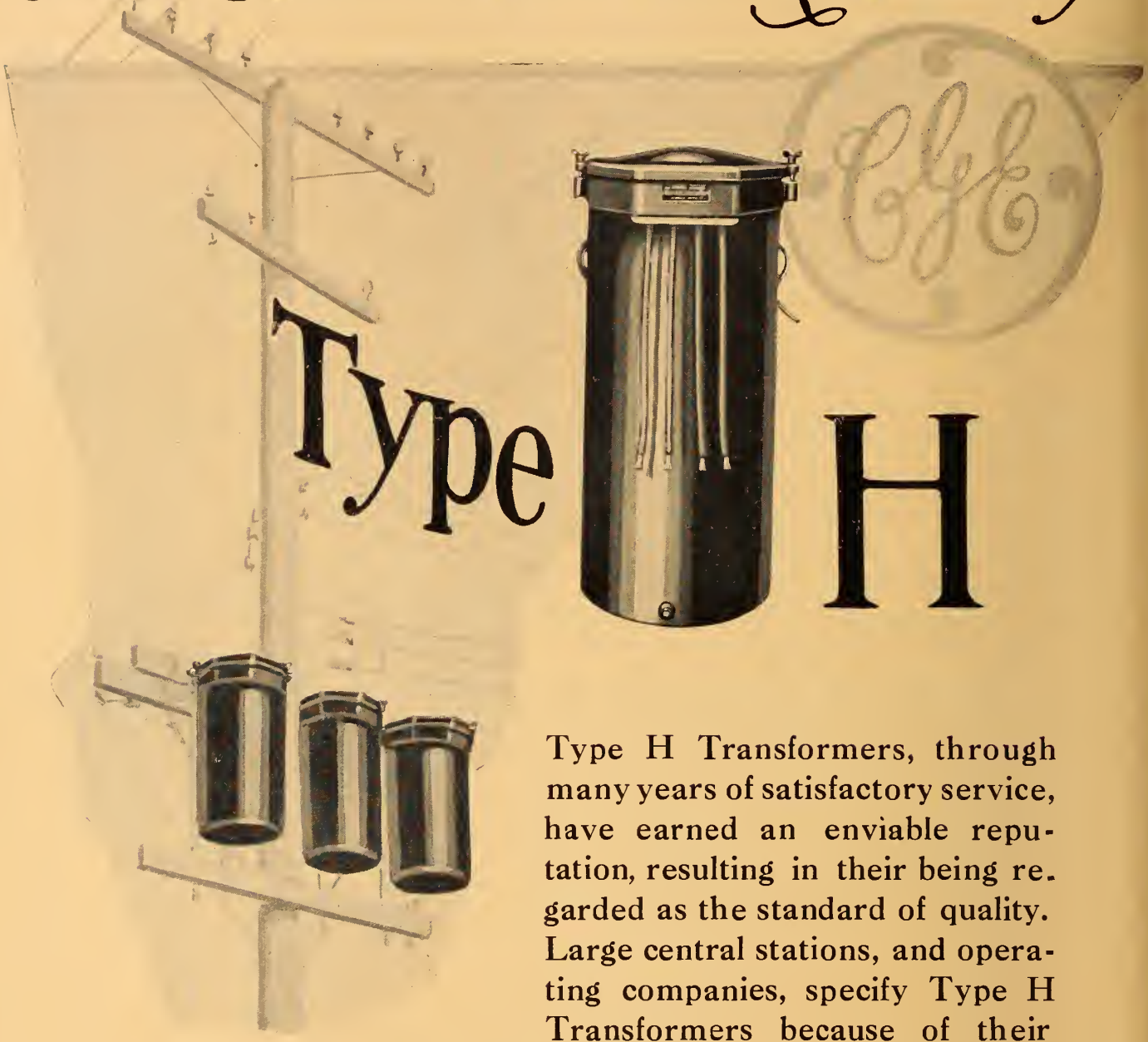
By featuring articles the public want, you can attract them into your store and the way is paved for further sales.

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited

The Standard of Quality



Type H

Type H Transformers, through many years of satisfactory service, have earned an enviable reputation, resulting in their being regarded as the standard of quality. Large central stations, and operating companies, specify Type H Transformers because of their long life, and excellent operating characteristics. Low depreciation rates and uninterrupted service will eventually win on any system.

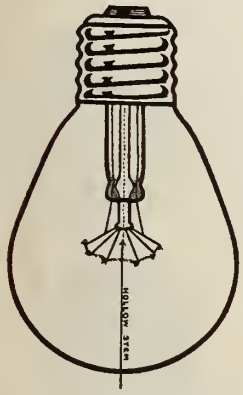
"Made in Canada" by

Canadian General Electric Co., Limited

HEAD OFFICE TORONTO

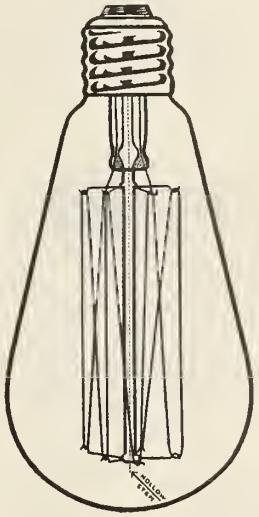
Branch Offices: Halifax, Sydney, St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

TIPLESS *Dalyte Holo-Stem* LAMPS



The development of DALYTE "HOLO-STEM" TIPLESS lamps marks the greatest advance in the art of incandescent lamp manufacture since tungsten alloy metal filaments were produced.

DALYTE "HOLO-STEM" TIPLESS lamps are protected by Wheeler Patent Pending, also by Trade-mark Registered, and are manufactured only by Dalyte Electric Ltd., Guelph, Canada.

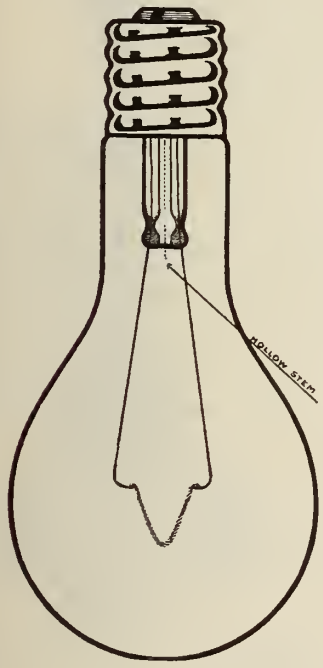


DALYTE "HOLO-STEM" TIPLESS lamps are made in all types and sizes from 5 watt to 1,000 watt, and the quality is positively unexcelled.

The "HOLO-STEM" method of construction is entirely new and novel and absolutely eliminates the glass stresses that are so prevalent in other makes of tipless lamps.

The demand for DALYTE "HOLO-STEM" TIPLESS lamps is already enormous, and in order that you be prepared to meet it, would suggest that you get in early communication with our nearest branch or Distributor—the list of same follows:

Dalyte Electric Ltd., 325 Howe St., Vancouver. Dalyte Electric Ltd., 556 Aylmer St., Montreal.



Dalyte Elecric Ltd., 163½ Church St., Toronto.

Dalyte Electric Ltd., Sanford & Main Sts., Hamilton.

Sumner & Co. Ltd., Moncton, N. B.

H. M. Hopper, 57 Dock St., St. John, N.B.

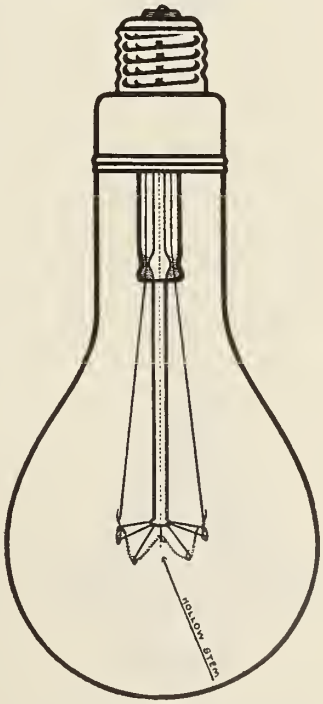
La Cie des Nouveautes "UNIVERSAL", 211 rue Des Fosses, Quebec City.

E. H. Briggs & Co., 619 Avenue Bldg., Winnipeg, Man.

Stratton-Steward Ltd., 239—10th Ave. E, Calgary, Alta.

The Western Lighting Agencies, 109—23rd St. E, Saskatoon, Sask.

Midland Electric Co. Ltd., 3129—10th Ave., Regina, Sask.



Head Office and Factory:

Dalyte Electric Limited

Guelph, Ont., Canada

1060 Series



Supplied in Cased-Glass

	Diam.	Depth	Fitter
No. 1060 —	12″	7″	6″
No. 1061 —	14″	8″	6″
No. 1062 —	16″	9″	6″
No. 1063 —	18″	10″	8″

Jefferson
MADE IN CANADA

LIGHTING UNITS

FOR EVERY REQUIREMENT

396 Series



Supplied in Moonstone R. I. or Cased-Glass

	Diam.	Depth	Fitter
No. 396 —	16″	10″	6″
No. 397 —	10″	10½″	6″
No. 398 —	12″	14″	6″

555 Series



Supplied in Cased-Glass, Sol-Lux, or etched design 167—Sepia

	Diam.	Depth	Fitter
No. 555 —	15¾″	8″	6″
No. 556 —	13″	8″	6″
No. 557 —	10″	8″	6″

550 Series



Crystal Enamelled

	Diam.	Depth	Fitter
No. 550 —	13″	8½″	6″
No. 551 —	15⅞″	11½″	6″

515 Series



Supplied in Cased-Glass, Sol-Lux, or etched design 166, as illustrated

	Diam.	Depth	Fitter
No. 515 —	10″	9¼″	6″
No. 516 —	14″	10″	6″
No. 517 —	12″	14″	6″

JEFFERSON GLASS CO.

Limited

Head Office and Factory:
388 Carlaw Avenue, - TORONTO

Prices to Electric Trade Only On Request

We Sell The Glassware Only



Exide-equipped signals similar to these are being installed by Canadian Railways.

Exide

MADE IN CANADA

BATTERIES

Where the power must not fail

There is no source of electric power supply so absolutely dependable as a fully charged storage battery. Wherever the power supply must not fail—in the hospital operating-room, in telephone, telegraph and fire-alarm systems, in the central power stations of the great cities—storage batteries are universally used to insure continuous service.

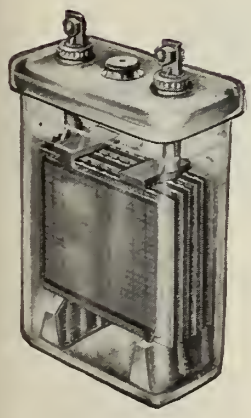
The Exide A. C. Floating Battery System of signal power supply maintains a fully charged Exide Battery at each signal location.

The A. C. System is built upon the fact that a fully charged storage battery represents the one sure source of electrical energy for any emergency. Therefore a fully charged Exide Battery is provided at each signal location.

Without dependence upon any human element, 100% of reserve is maintained against any interruption of the normal current supply. If an outage occurs on the transmission line, the Exide Battery supplies signal-operating current for weeks without interruption.

The positive, unfailing supply of power to every signaling function is insured; voltage is steadily maintained; operation is not interfered with by low temperatures.

The many advantages and economies of the Exide A. C. Floating Battery System can hardly be set forth in this short space. We shall be glad to supply further detailed information upon request.



Exide KXH Cell

Used with the Exide A.C. Floating Battery System. Shipped ready for use. Designed for installation in same compartment with relays or other apparatus.

EXIDE BATTERIES OF CANADA

LIMITED

153 Dufferin St. Toronto

CANADIAN PORCELAIN CO.

LIMITED

HAMILTON - CANADA

Manufacturers of High and Low Tension Porcelain Insulators



DUNCAN

Watthour Meters

for Sustained Accuracy

Through Years of Service

THE GEORGE C. ROUGH SALES CORP'N. 134 CORISTINE BLD'G. **MONTREAL**

It only weighs 9 pounds and is easy to carry from room to room

The Westinghouse Cozy Glow Radiator



Throws the heat in a steady stream in any direction.

It furnishes instant, sanitary heat on chilly mornings and evenings for the bedroom, bathroom or nursery.

The heating unit consists of a porcelain cylinder around which the heating element is wound. It is protected by a stout, copper-wire guard.

Canadian Westinghouse Co., Limited, Hamilton, Ontario

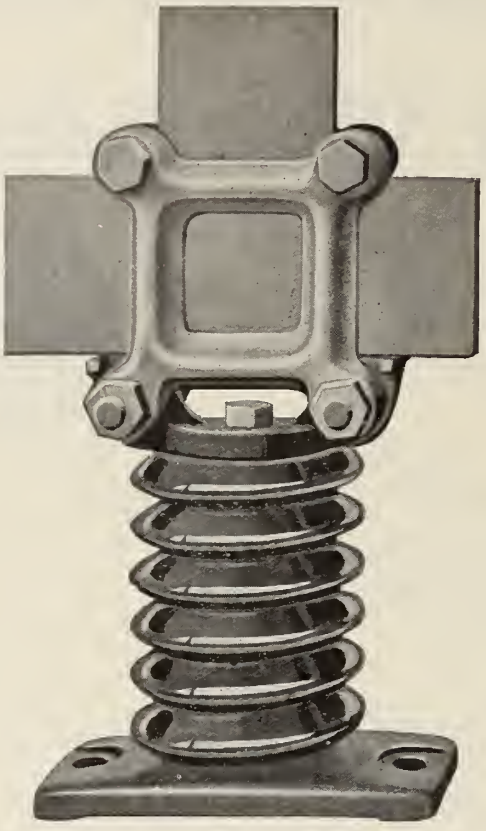
TORONTO, Bank of Hamilton Bldg.
HALIFAX, 105 Hollis St.
CALGARY, Canada Life Bldg.
MONTREAL 285 Beaver Hall Hill
FT. WILLIAM, Cuthbertson Block
VANCOUVER, Bank of Ottawa Bldg.
WINNIPEG, 158 Portage Ave. E.
EDMONTON, 211 McLeod Bldg.
OTTAWA, Ahearn & Soper, Ltd.

Repair Shops

MONTREAL, 113 Dagenais St.
WINNIPEG, 158 Portage Ave., E.
VANCOUVER 1090 Mainland St.
TORONTO, 366 Adelaide St. W.
CALGARY, 320—8th Ovenue West

Westinghouse

INDOOR BUS SUPPORTS
STYLE C



S & C LINE STYLE C
Corrugated
INDOOR BUS SUPPORTS
Characterized by
Simplicity
Adjustability
Sturdiness
High Factor of Safety

Send For New Bulletin 223

DISTRICT OFFICES:
TORONTO: 24 Adelaide Street, East
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WINNIPEG: 703 Confederation Life Bldg.
VANCOUVER: 609 Credit Foncier Bldg.

Schweitzer & Conrad, Inc.
4435 Ravenswood Ave., Chicago, U.S.A.

Better Fixtures Make Better Homes

No. 17284



"Notice the Lighting Equipment"
"Everywhere you go"

Lighting fixtures are the most conspicuous and important detail of the interior furnishings. They hold the attention and create the final impression by which the home and taste is appraised.

If you select from the CROWN LINE you get the best lighting fixtures.

Crown Electrical Mfg. Co.
Limited
Brantford :-: Ontario

"Reel Service"

From Coast to Coast

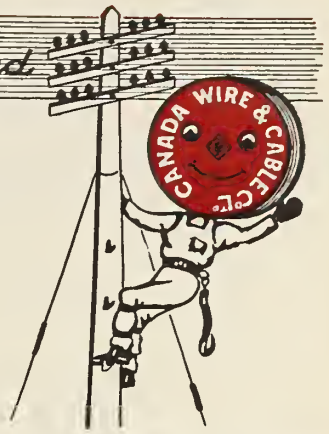
Canada Wire & Cable Co. limited

Halifax Montreal Toronto Regina
Winnipeg Calgary Vancouver

MANUFACTURERS OF
Copper
Bare, Weatherproof, Rubber Covered

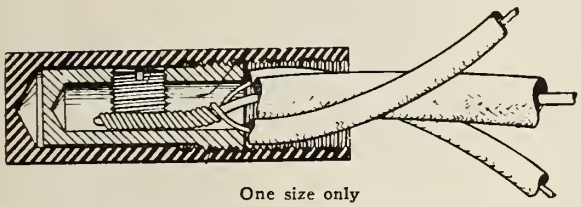
Electrical Wires and Cables

and STEEL WIRE ROPE



THE MARR

Insulated Wire Connector



One size only

Takes any fixture condition
Hydro Laboratory Approval No. 985
Underwriters Laboratory Approval No. 6038
EVERY CONNECTOR FULLY GUARANTEED

All danger from soldering entirely removed

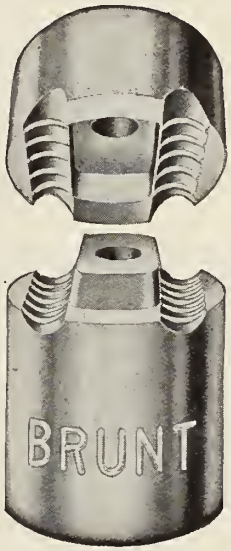
PASTELESS SOLDERLESS TORCHLESS TAPELESS
CLEANER NEATER QUICKER CHEAPER

Ask Your Jobber or Send for Sample

Sole Manufacturer

W. P. MARR 102 Russett Ave.
Toronto - Ont.

BRUNT



HIGHEST QUALITY
PORCELAIN
KNOBS
TUBES
CLEATS
AND
SPECIALTIES

CANADIAN REPRESENTATIVES
Duggan Import Sales Co.,
162 King Street, West,
Toronto, Ontario
Russell Fowler Co.,
306 Notre Dame Avenue,
Winnipeg, Man.

THE BRUNT PORCELAIN CO.
Columbus Ohio

The Star Porcelain Company

TRENTON, N. J.

Manufacturers of Electrical Porcelain Specialties. Also specialize in the manufacture of heater bricks for electric ranges.

Columbia Pyramid Brushes for Motors and Generators

Uniform in Size Structure, Capacity and Performance

ANY brush on ANY motor or generator won't give proper results. A correct analysis of all the relevant facts is necessary. Let us help you. Years of experience in making brushes have qualified us to decide the correct brush for every type of motor and generator.

The Columbia Pyramid Brushes specified are guaranteed correct.

C N C

Look For This Mark on Your Brushes

CANADIAN NATIONAL CARBON CO. LIMITED

MONTREAL TORONTO WINNIPEG

Before you buy

FERRANTI

POLE TYPE

TRANSFORMERS

compare their Efficiency, Exciting Current, Overload Capacity, Light Weight, Insulation Strength and General Construction Details with those of any other type.

Ferranti Transformers merit inspection and the company welcomes it



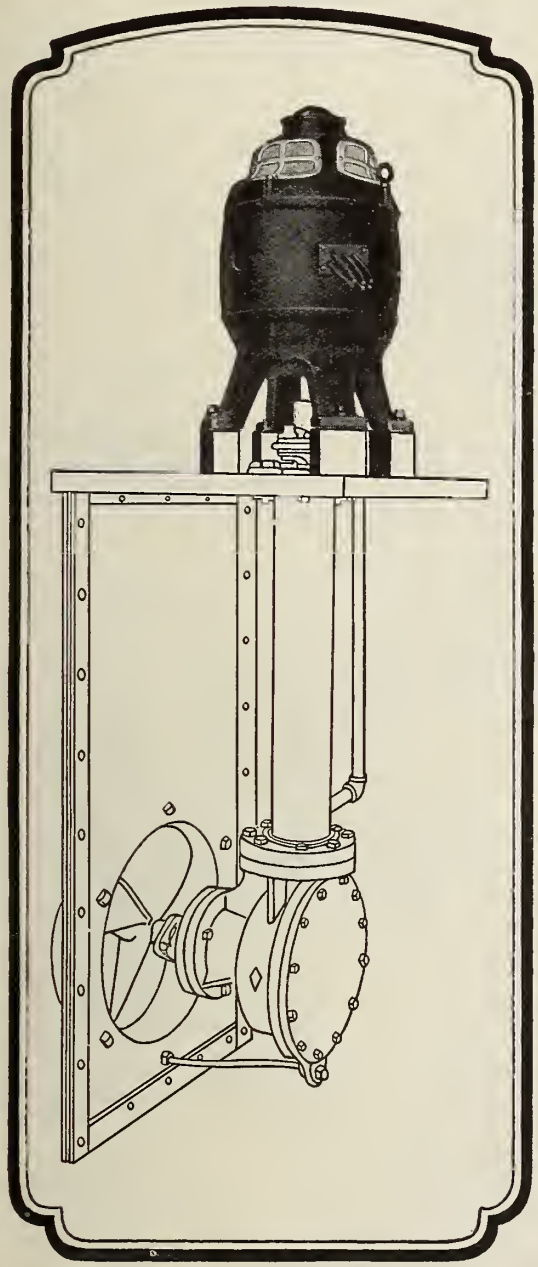
S. P. Pole Type Transformer, Welded Steel Case and Cast Iron Cover

FERRANTI METER & TRANSFORMER MFG. CO. LIMITED

26 Noble St. TORONTO 128 Bleury St. MONTREAL Simpson Bldg. HALIFAX 145 Market Ave. WINNIPEG

Northwestern Engineering & Supply Co. Calgary Northern Ontario J. P. Bartleman, Timmins

Another case where continuous service demands



Wagner, Quality Motors

TO ice plant operators continuous, rapid and thorough brine circulation is essential to ice production.

The brine agitator, illustrated, is, on this account, largely preferred by ice men.

And for two reasons.

First, because it is so designed as to permit the agitator to be lifted out of the brine for easy and quick repair.

Second, because the manufacturer furnishes Wagner,Quality Motors as standard equipment with this machine.

It is asking a good deal of a motor to expect it to give long, dependable service in the damp, salt atmosphere of brine—but that is why they use Wagner,Quality Motors.

That *extra* dependability characteristic of Wagner,Quality Motors should help sell your machine—solve your motor drive problem.

Wagner, Quality Motors

WAGNER ELECTRIC MANUFACTURING CO. of CANADA, LTD.
Power Building Montreal
217 Dundas St. E., Toronto
61-5420-9

Sepco AUTOMATIC ELECTRIC

Announcing Reduction

in Price of Non Automatic Water Heaters

Owing to greatly increased production, we are pleased to announce a reduction in price of Type 3130 Non Automatic Sepco Water Heaters from $42.00 List to $36.00 List. EFFECTIVE IMMEDIATELY.

On and after August 15th, we will move to our new plant at 39 Richmond St. East, as we have outgrown our present site.

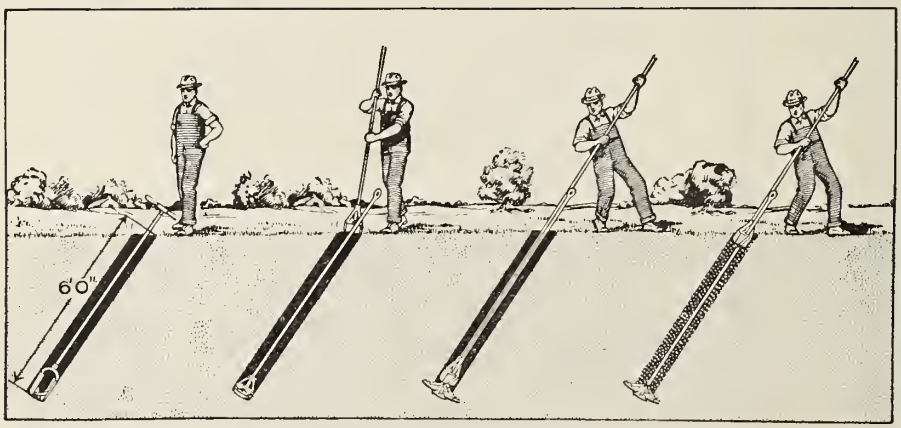
Mr. Electrical Dealer: Are you going to grow with us? Instal Sepco Water Heaters. You will satisfy your customers—Service and satisfactory performance is the keynote of any business.

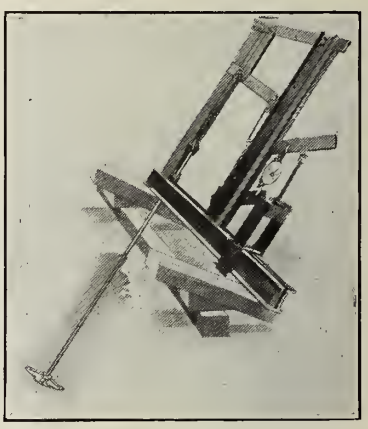
—MADE-IN-CANADA—

SEPCO AUTOMATIC ELECTRIC HEATERS, LIMITED

47 Richmond St. East, Toronto

ACTUAL ENDURANCE TESTS SHOW—THEY HOLD!





5½ MINS. to dig 8" hole with earth auger. + ¼ MIN. to insert 8" 4 blade Hanson Expansion anchor. + ¼ MIN. to expand anchor to twice its original diameter. + 5½ MINS. to tamp earth back. = 11½ MINS. to provide anchoring capacity up to **12,000 Lbs.**

Demonstrated by machine tests in Loamy Soil

THE HANSON EXPANSION ANCHOR

AN ECONOMICAL AND EFFECTIVE GUY WIRE SUPPORT

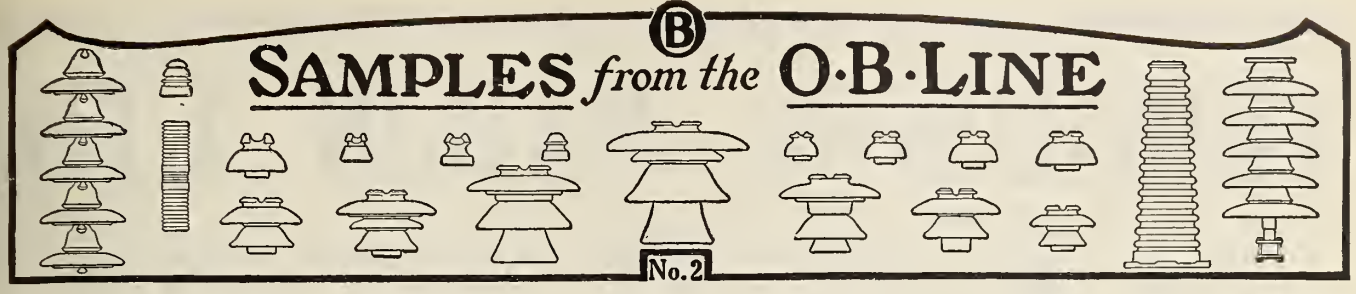
Regularly Supplied in 6" and 8" sizes — 2 and 4 blade

CANADIAN LINE MATERIALS LIMITED

HILLINGDON AVENUE

TORONTO — ONTARIO

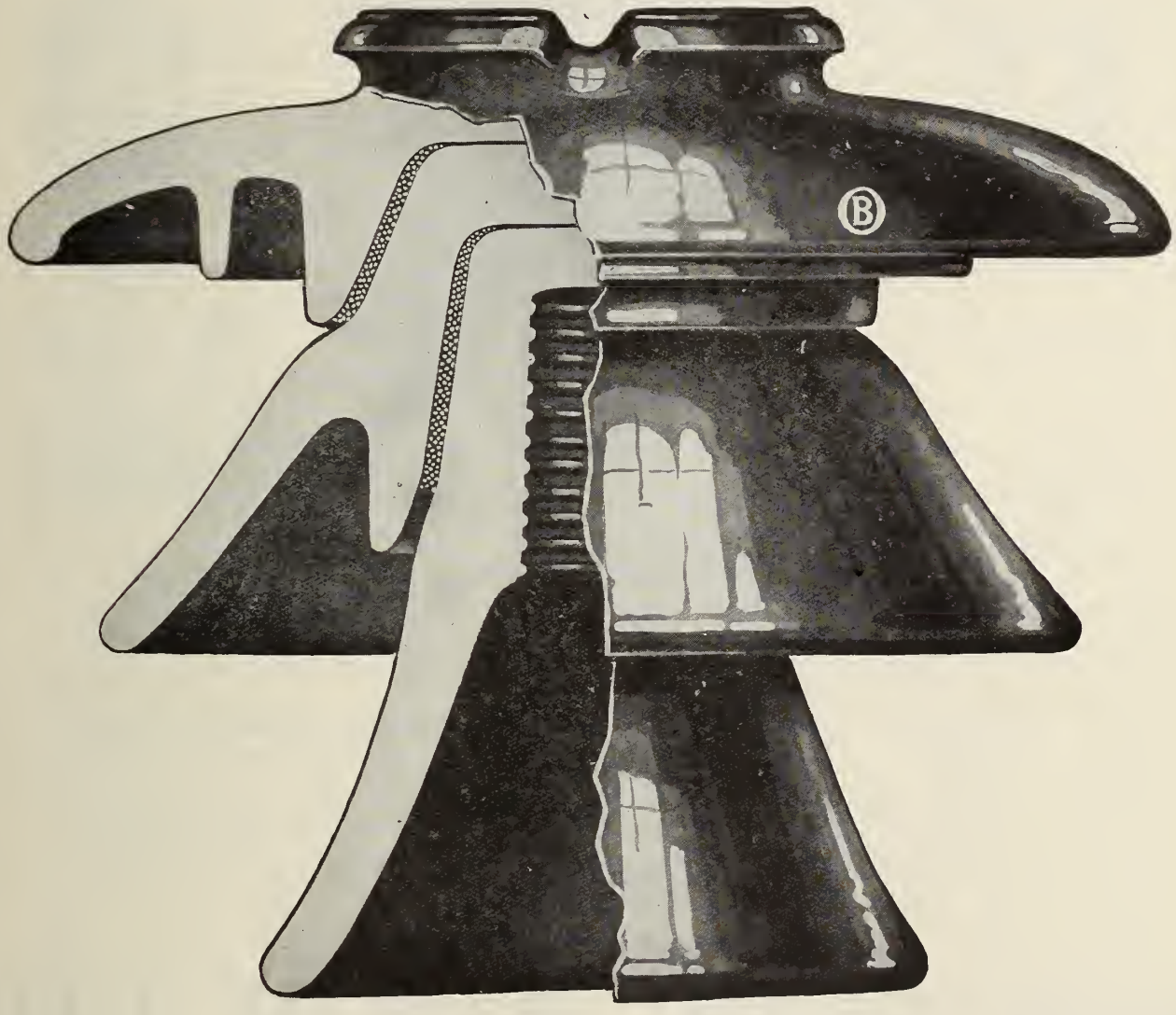
Ask for Bulletin No. 18



High Voltage 3-piece Insulator

The enviable record of this insulator, No. 12552, is known wherever insulators are used. In the design of this insulator, special attention was given to the reduction and distribution of internal stresses due to sudden changes in temperature.

The highly satisfactory performance of the insulator after years of service, has fully justified the attention given this factor.



113

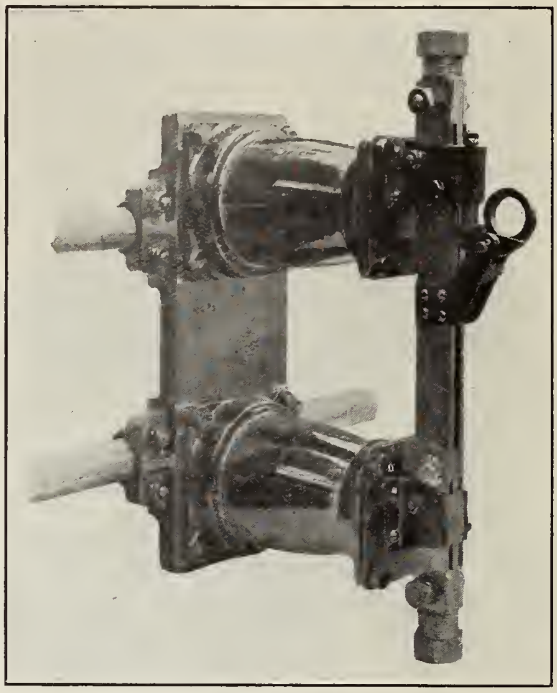
Dominion Insulator & Mfg. Co. Limited

(Manufacturing Ohio Brass Company Products in Canada)

Niagara Falls - - - - - - Ontario

FERGUSON, PAILIN LTD.

Canadian Office and Warehouse:
321 KING STREET EAST, TORONTO, ONT.



A Reliable Disconnect

HEAVY DUTY DISCONNECTS, as supplied to the Hydro Power Commission of Ontario comprising:-

1. Jig assembled interchangeable Porcelain units—the same units are also applied for bus bar supports.
2. Substantial Locks.
3. Large eye release for pole operation.
4. Straight through contact jaws—**joints and right angle bends eliminated.**

   Note: With the omission of the right angle bends, the heavy magnetic field is eliminated when under short circuit conditions.
5. Substantial case base for pipe or wall mounting, resisting distortion when bolting up to an uneven surface.

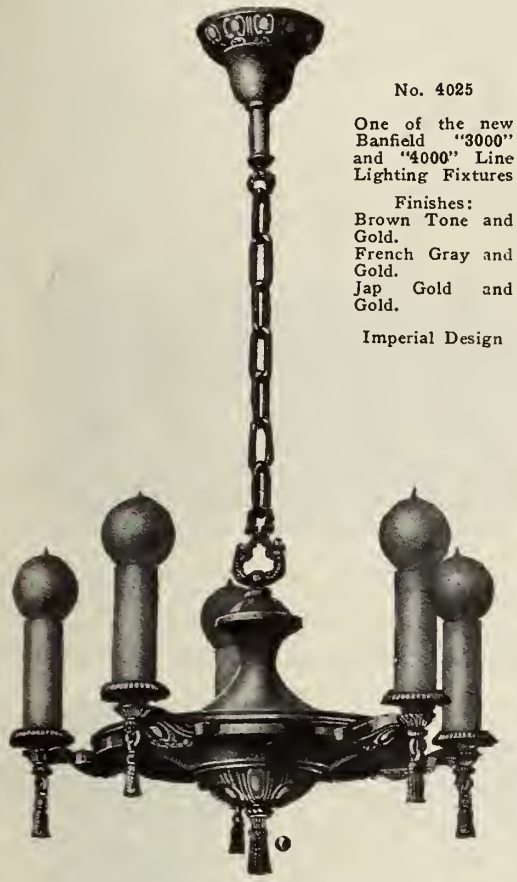
Enquiries Solicited.

FERGUSON, PAILIN LTD.

Manager:
HERMAN K. ANSINGH

"Notice the Lighting Equipment"
"Everywhere you go"

Fine Art Fixtures
to sell at
Popular Prices



No. 4025

One of the new Banfield "3000" and "4000" Line Lighting Fixtures

Finishes:
Brown Tone and Gold.
French Gray and Gold.
Jap Gold and Gold.

Imperial Design

MAKE MORE MONEY

THE Banfield "3000" and "4000" line has proved an instant success. Dealers all over Canada are saying it's a winner. These Banfield creations combine style and distinction with quality. They are as attractive in price as design. You'll make more profit and sell more fixtures if you stock this line for fall trade.

Write for Catalogue showing the complete range in this new line.

Your Jobber Stocks Banfield Fixtures

W. H. BANFIELD & SONS Limited

370-386 Pape Ave., TORONTO

MONTREAL
A. B. Cornwell,
51A Sussex Ave.

WINNIPEG
Cochrane, Stephenson & Co. Ltd.,
602 Avenue Block

VANCOUVER
Cochrane Stephenson & Co. Ltd.,
901 Credit Foncier Bldg.

NUMBER 5

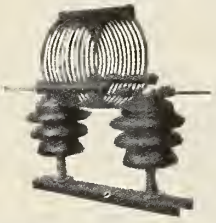
This is the fifth of a series of ten advertisements

The Line that R. and I. E. Co. Builds!

This is the  Base—Steel Channel

That supports the  R. & I. E. Interchangeable Insulator Units with Forged Steel Pins and Pressed Steel Caps. No clamps, no screws

That receives the  Coils are built in three sizes, viz 9" dia., 12 turns; 15" dia., 12 turns; 15" dia., 20 turns. All coils are stiffened with treated wood braces

That makes up the  Interchangeable Unit Choke Coil. Standardized parts, competently designed and carefully made, insure interchangeability

Interchangeable Unit Choke Coil
that R. and I. E. Co. Builds

R. & I. E. Interchangeable Insulator Unit Equipment for outdoor service includes Bus Supports, Disconnecting Switches, Air Break Horn Gap Switches, Choke Coils, Fuse Holders, Lightning Arresters, Substation Combinations and Outdoor Steel Substations.

Manufactured by
Railway and Industrial Engineering Co.
Greensburg, Penna.

5



Street Lighting Equipment

New Designs using Holophane Glass

We also solicit your enquiries for the products of

Weston Electrical Instrument Co.
The Bristol Co.
Metric Metal Co.
Albert & J. M. Anderson Mfg. Co.
Philadelphia Electrical & Mfg. Co.
Railway & Industrial Engineering Co.
General Devices & Fittings Co.
G & W Electric Specialty Co.

Powerlite Devices, Limited

Successors to
A. H. Winter Joyner Limited,

62 Front St. West, TORONTO
New Birks Bldg., MONTREAL

This "UNITED" Audio Frequency Amplifying Transformer Approaches Your 100% Ideal



Is a necessary part of any set that shall bring in signals from any distance, clear, strong, free from whistling or howls, and, is so recognized in the trade.

Magnetically shielded in a shell of our own design. Ratio 5 to 1.
Retail Price - - $4.50

"UNITED" Variable Condensers



are designed for maximum efficiency and largest capacity and resistance to "shorting." They satisfy *everybody* so thoroughly that they have become standard in the industry. Ask for details of our new plate condenser Vernier dial assembly.

United plate condensers are supplied in 43, 23, 11, 5, and 3 plates. Send for lists and discounts of the Quick-Selling "United" line.

UNITED MFG. AND DISTRIBUTING CO.
9705 Cottage Grove Ave., CHICAGO, ILL.
NEW YORK OFFICE, 50 Church St., New York, N.Y.
SAN FRANCISCO OFFICE, 709 Mission St., San Francisco, Calif.

KLITZEN

REGENERATIVE—

Receiving Sets

Real Radio Simplicity

Only one adjustment

Licensed under Armstrong Patents

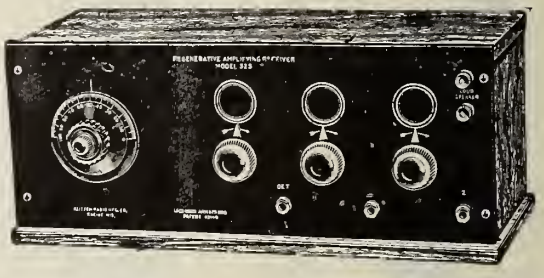
The principal feature of No. 525 Regenerative Tuner Detector, 2-stage audio amplifier is SIMPLICITY.

Any operator can get wonderful results because there is only one adjustment. Receiving Range practically the same as that of the best radiophone equipment on the market.

Each unit carefully tested before shipment. The best material and most highly skilled workmanship employed—it is the product of experts who have been making radio equipment since 1913.

JOBBERS AND DISTRIBUTORS. Write for full information and big discounts. DEALERS—ask your jobber or write us.

KLITZEN RADIO MFG. CO., Inc.
Racine, Wis.



MODEL No. 525

LIST PRICE $80.00

Interior Telephones

for

Apartment House, Factory, School, Hospital, Office

Electric Reset Annunciators and Signal Specialties

Hospital Signal System

A complete new silent call system for hospitals. Registers at nurses' quarters and office with time record, if wanted.

Canadian Factory Representatives:

Cochrane, Stephenson & Co. Ltd.
850 Hastings St.
Winnipeg, Man.

Cochrane, Stephenson & Co. Ltd.,
901 Credit Foncier Bldg.,
Vancouver, B.C.

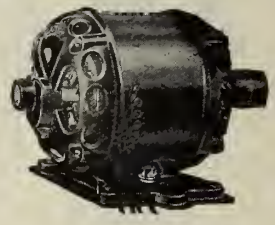
Timberlake & Bourne
New Birks Bldg.,
Montreal, Quebec

The Pierce Electric Company,
104 Richmond St. West,
Toronto, Ontario

CONNECTICUT TELEPHONE & ELECTRIC COMPANY
MERIDEN CONNECTICUT

Century

Fractional Horsepower
Type "R S" Induction



Single Phase Motors

Develop a high starting torque with a low starting current. A fuse which will protect the motor while running, is usually of ample capacity for starting, due to the low starting current and quick acceleration.

These are most desirable characteristics as is evidenced by the adoption of these motors as standard by many manufacturers of pumps, air compressors and similar apparatus.

Temperature Rise not more than 40° Centigrade

CENTURY ELECTRIC CO.

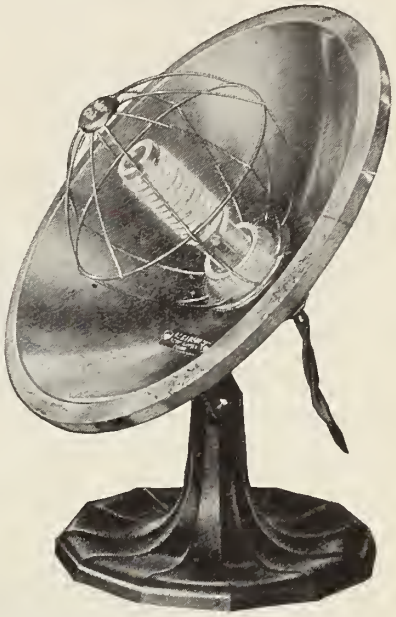
1827 Pine Street ST. LOUIS, Mo., U.S.A.

Stock carried in Canada by:
Jones & Moore Electric Co. Ltd., 294 Adelaide St. W., Toronto
Great West Electric Co. Ltd., Winnipeg
Rudel-Belnap Machinery Co. Ltd., Canadian Express Bldg., Montreal
Rankin & Cherrill, 55 Hastings St. W., Vancouver, B.C.

Polar Cub
Electric Heater
Retails $7.50

Approved by Ontario Hydro Electric Commission

Nearly every feature of our new Heater has been improved and it represents the best value offered on any market.



Specifications

Solid copper reflector 11″ diameter, beautifully burnished, adjustable reflector—wire guard and filament easily detachable. Screw in filament equal to the best. 600 Watts 110 A.C. or D.C. Equipped 7 feet No. 16 Heavy Heater cord and two piece separable plug. Complete window display material with every dozen Heaters.

The A. C. Gilbert Menzies Company, Limited

439 King Street W. - Toronto, Ont.

Polar Cub Fans — Hair Dryers — Vibrators — Sewing Machine Motors — Radio

Are you using Rawlplugs?

Rawlplugs save time, money, labor and material. They never fail—because they are made on an entirely new principle that is scientifically correct.

Once in place the Rawlplug holds the screw in a vicelike grip which is unaffected by temperature changes, shocks or other conditions.

Millions of Rawlplugs are now in use and there is hardly a building of any importance being erected today on which they are not used.

Write us for samples and prices.



Electricians' Outfit

INVENTIONS LIMITED

Sole Agents for
THE RAWLPLUG CO., OF CANADA
Southam Bldg., Bleury St., MONTREAL

Sales Agents
Dominion Engineering Agency, Ltd., 24 Adelaide St., East, TORONTO
Sterling Specialties, 213 Somerset Building, WINNIPEG, MAN.
H. G. Evans, 58 Water Street, St. John, N.B.
Blackadar & Stevens, 139 Roy Building, Halifax, N.S.
Frank Raw & Co., 325 Howe St., Vancouver, B.C.
Agents wanted in Ottawa

EBY BINDING POSTS INCREASE THE VALUE

of your equipment by increased efficiency and neater appearance.

They eliminate Poor Connections, Damaged Terminals, and Lost Parts. They have larger Contact Surfaces.

Standard Equipment by Leading Manufacturers.

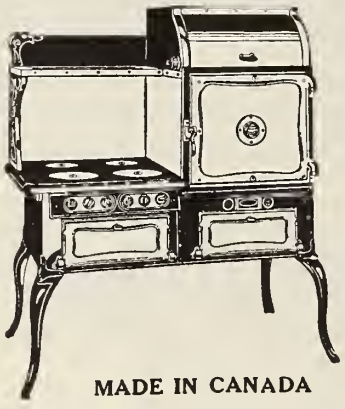
Sold by leading Radio Dealers.



Distributed By—THE WALLACE BARNES CO., LTD. - - HAMILTON, ONT.

Chromel
MARSH ALLOYS

Stands the Heat



It won't scale off. It stands high temperatures better than any other alloy known. It is made in all sizes for Electrical Heating devices. Can you use an element like this?

Write for full particulars.

MADE IN CANADA

HIRAM WALKER & SONS METAL PRODUCTS, LIMITED

WALKERVILLE, ONTARIO.

Canadian Armature Works

St. Catharines, Ontario, Canada

Night phone: 1496 Day phone: 223

Electrical Repairs **Power Installations**

Manufacturers

Motors **Commutators** **Transformers**

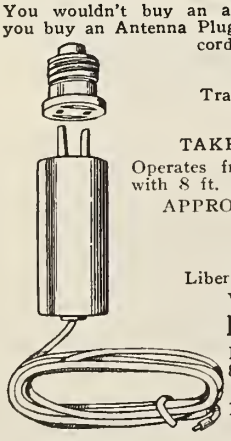
Coils for railway equipment

Armatures rewound, any type of coil manufactured

Write us for prices on Motors, Coils and Repairs

Let us figure on your requirements

You wouldn't buy an automobile without a self starter. When you buy an Antenna Plug insist on one complete with a handsome cord. Buy the original.



Trade "NO AERIAL" RAD-O-PLUG Mark

TAKES THE PLACE OF AN AERIAL

Operates from any electric light socket. Complete with 8 ft. cord.

APPROVED BY NATIONAL BOARD OF FIRE UNDERWRITERS

PRICE $2.50

Liberal discounts to jobbers and dealers

Write for circulars Agencies Open

Radio Products Corporation

Manufacturers Distributors
8926 Clarendon Ave., Detroit, Mich.

Representative for Western Canada:
F. E. Garrett & Co., 607 Union Trust Bldg.
Winnipeg, Man.

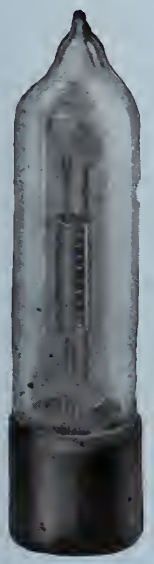
Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition which might save your city or town or your client many hundreds of dollars.

THOUSANDS ARE BUILDING THEIR RADIO SETS



R 215A Peanut Tube

The Peanut Tube is therefore a necessity.

For bringing in distant stations it has no equal.

Operates on a single dry cell battery.



R40 SOCKET

DEMAND YOUR SUPPLY
AND
SUPPLY YOUR DEMAND

Manufactured in Canada by

Northern Electric Company
LIMITED

MONTREAL TORONTO WINDSOR CALGARY
HALIFAX HAMILTON WINNIPEG EDMONTON
QUEBEC LONDON REGINA VANCOUVER

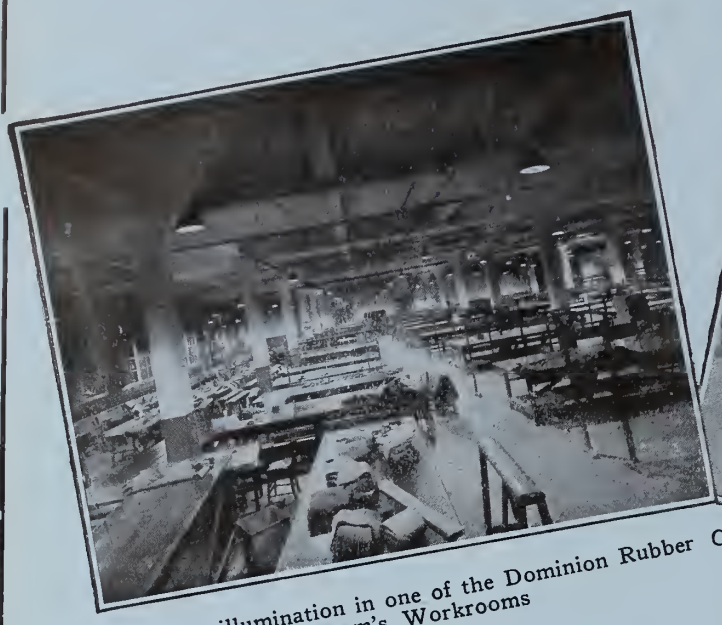
"Makers of the Nation's Telephones"

MANUFACTURING
Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and receiving Equipment

DISTRIBUTING
Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

Dealers apply to nearest branch house for prices and discounts

For Better Illumination



Correct illumination in one of the Dominion Rubber System's Workrooms



Correct illumination in E.G. Gooderham & Company's Automobile Showrooms, Toronto

These Installations solved two problems of Correct Lighting

Your territory teems with unsolved lighting problems. Many factories, offices, stores, hotels, churches, theatres and other public buildings are poorly illuminated. New buildings are constantly being erected. Every lighting prospect has its own peculiarities to meet for which a variety of fixtures are designed. It becomes a question of correct application. Let our illumination specialists assist you in deciding the form of lighting best adapted to your clients' needs.

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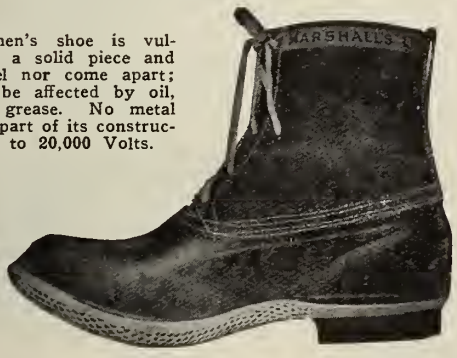
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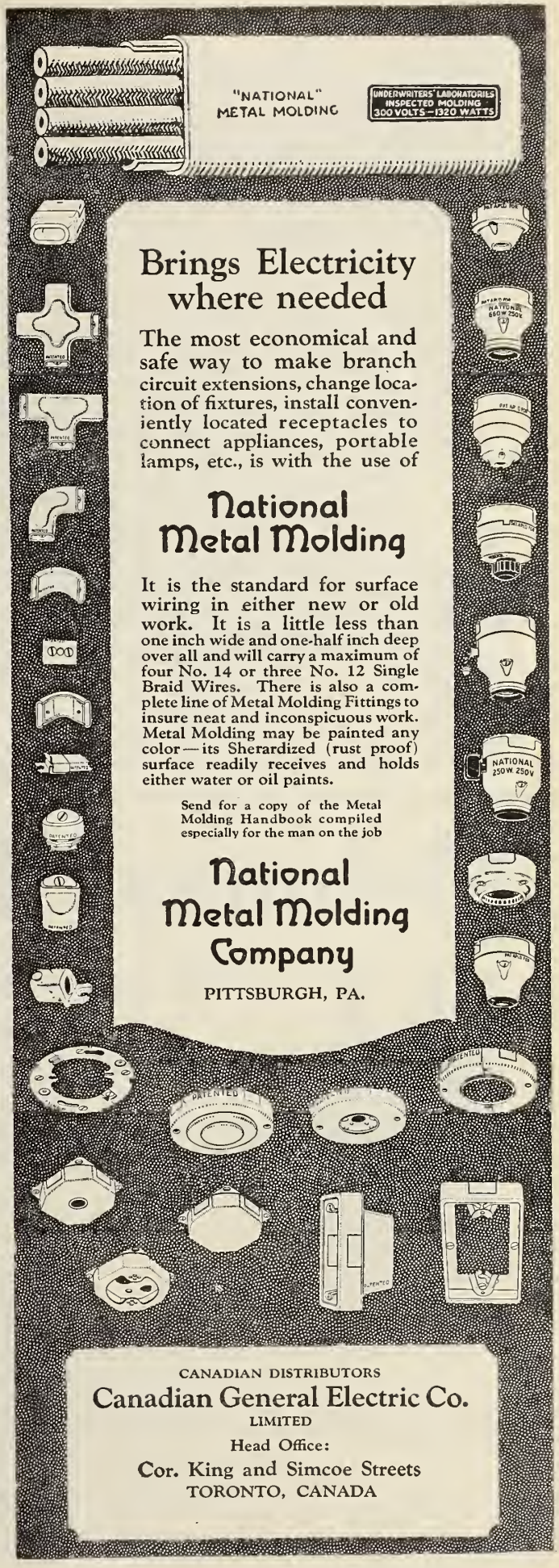
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The most economical and safe way to make branch circuit extensions, change location of fixtures, install conveniently located receptacles to connect appliances, portable lamps, etc., is with the use of

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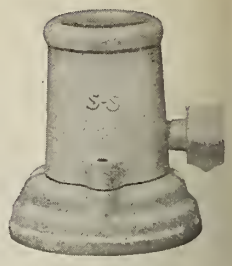
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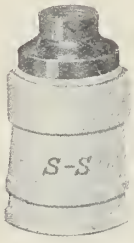
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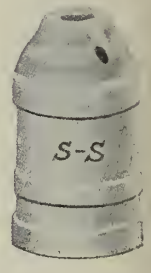
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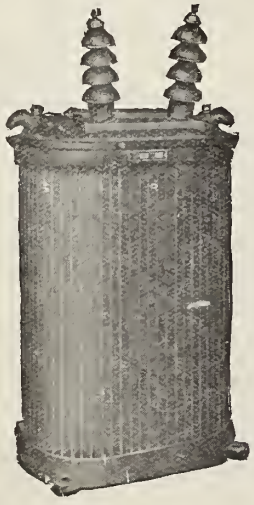
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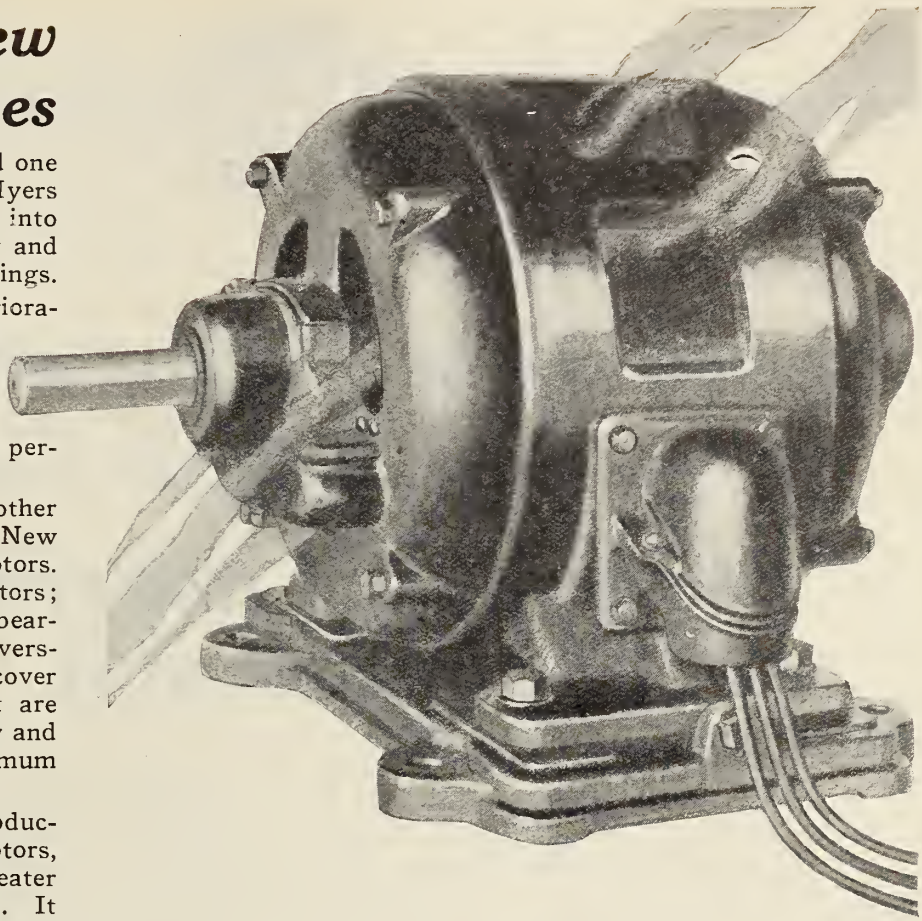
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Equally advantageous are other features combined in the New Type "L" polyphase Motors. They have higher power factors; improved starting torque; bearings that are dust-proof; reversible terminal box with cover removable; size and weight are decreased with added rigidity and strength—all to obtain maximum economical service.

To motor dealers, the introduction of the new Type "L" Motors, is an opportunity for greater sales in the polyphase field. It will be to your advantage to write, today, for particulars covering this new line of motors embodying these remarkable engineering achievements.

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The Robbins & Myers Company of Canada, Limited

Brantford — Ontario

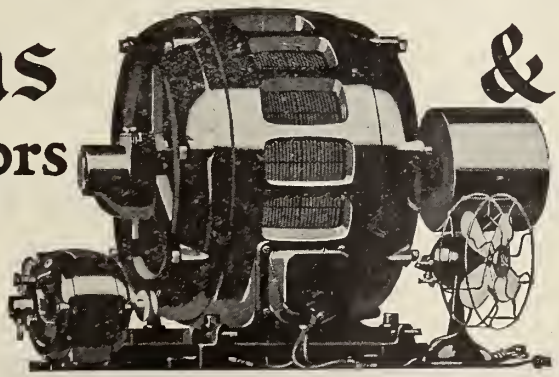
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but here are a few:

It is the most modern and economical method of protected wiring.

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Western Agents

COCHRANE STEPHENSON CO.

WINNIPEG - - VANCOUVER

Miss Cox lightly tosses the wringer in the air, and the crowd gasps



She always appears as if she thoroughly enjoyed her job of window demonstration

How to Draw Crowds to Washer Demonstrations

Miss Cox Has the Secret—Keeping Them Guessing— Devices that Hold Interest

Miss Ruby Eden Cox is a small person, who weighs big in the washing machine business. She is a tip-top demonstrator for the Eden washer, and has definite ideas on how this work should be done. Miss Cox recently carried out a very successful demonstration in the Toronto Hydro store window and afterwards explained the technique of the demonstration to the Electrical News, as follows:

"The first principle of window demonstration work is that you must keep the crowd entertained. A humdrum, placid sort of demonstration will attract two or three maybe, but if you want crowds (like I had today) you've got to hold their interest. They like fun, and that is the only way to get them.

When a Negro Mammy Took Part

"There are various ways of brightening up the demonstration. Sometimes I write things on the backs of the cards, and show them to the crowd. You remember that I sit on the machine to show that it can't be tipped—then I show a card written 'I weigh 138 lbs., 16 years old'—they always laugh when they see that. Of course a lot depends on where the demonstration is staged. . I would call this a place where a rather more dignified treatment is demanded, but at a food show, or in a small town, it is possible and desirable to be much less restrained. I remember one occasion where I gave the regular Eden demonstration, and at the same time had a negro mammy in the other window working away at an old-fashioned tub. That scheme was a knock-out."

"But don't you think that people are inclined to watch the demonstrator and forget the machine?" asked the interviewer.

"Not at all," replied Miss Cox. "They can't help seeing the machine—some fact or other is bound to be driven home. You remember how I lifted the wringer, and swung it up? Do you think anybody can see that, and forget that it is light and easily detachable?"

"Well, I agree with you. Now, would you mind outlining the actual process of a usual demonstration, from the time you enter the window?"

"Why, certainly. First, I try to draw a crowd. Any little bit of action will do this—generally I run a towel through the wringer and if necessary have some of the staff go outside and watch. That starts the crowd, which multiples like a rolling snowball.

"Then I show how the washer is started, making every point clearly and slowly. It is a good plan to fix on some sympathetic looking individual and sort of work to keep him in sympathy with you.

Dumfounded by a Towel

The wringer features are next in order, and I show how it opens, swings, starts, and so on. But all this process of demonstration will go dead without an original touch of some kind. Now with the wringer, at one point I act the part of a woman who doesn't understand it. I purposely catch a towel between the rolls and stand there dumfounded trying to pull it out—then a brilliant idea strikes me and I touch the releasing screw—out it comes. I try to feel what I am acting and I believe this keeps the crowd in sympathy with me.

"You can tell everybody that an efficient demonstrator must understand washing. Home demonstration is a different subject altogether, but I must say that I have often seen salesmen demonstrating who understood the machines, but fell away off when it came to the technique of washing. There is more to it than meets the eye—you must know fabrics, know soaps, and often the water makes a difference.

"The greatest lesson of my experience is that a window demonstrator must forget his or her dignity and be original. Get the crowd guessing and your demonstration is a winner."

"How Long Will it Last?"

When customers demand to know how long the washing machine will last, the dealer is sometimes up against it to answer them. It is of course generally easy to evade the question, or to say that you have seen a machine running for eight or ten years with no signs of break-down, and so on.

The fact is, however, that a good machine will last an extraordinary length of time, with proper care. There is definite knowledge of a washer that operated for over 9,000 hours, as a demonstrating machine. How long a use in the home would that represent?

Well, of course, it would not have the same care in the home, but just for the sake of comparison, let us figure it out. Say it was used an average of six hours a week. That makes 1,500 weeks, or something over 28 years. In practice this figure would not be reached, but it shows that the prospect need not worry about the machine wearing out.

Are We Sold?

Countless electric irons have been sold because electrical men had faith in them and communicated their enthusiasm to customers. When we acquire as great a belief in the electric washing machine as we have in the iron, our sales will increase in corresponding volume.

Fred Babcock to Coffield Washer Company

The Coffield Washer Company of Canada, Ltd., announce that they have secured the services of Mr. Fred S. Babcock, formerly with the Easy Washer Company, as sales-manager. Mr. Babcock is well known in trade circles, and his past success will no doubt continue.

Portables in Great Vogue

A view in the stores in every section of the country shows the wide, and still increasing, popularity of portables in the home. The modern housewife feels no room complete without its full allotment of tables and lamps. Even milady's dresser must be adorned with chic dainty boudoir lamps. A marked tendency of this portable era of lighting is the popularity of hand-decorated glass shades. To meet this demand a complete new line, comprising 71 distinctive table lamps and 20 attractive boudoir lamps, has been developed by the Consolidated Lamp & Glass Company of Coraopolis, Pa.

A Stage Lighting Booklet

"Theatre Lighting" is the title of an attractive booklet just received from the Ward Leonard Electric Company, Mount Vernon, New York. It contains a detailed, well-illustrated history of stage lighting, and shows the latest applications of Ward Leonard equipment to this service.

Catchy Placards for Window Demonstration

"Don't kill your wife with a washboard—let the Eden washer do the work."

"If men had to do it, we couldn't make 'em fast enough."

"You may have a free demonstration in your home."

"No more fussing from hubby because he has no clean shirts."

Familiar Sayings on Wash Days

"I wish the men had to do the washing."

"No wonder I am looking old."

"Run away, children, Mother is tired."

"I wish John would buy me an Eden."

"Oh my poor back—I am too tired to get supper."

Illuminating Engineering Society Convention

Detailed plans for the special features which will mark the 1923 convention of the Illuminating Engineering Society to be held at Lake George, N. Y., Sept. 24 to 28, are nearing completion and promise to surpass in spectacular effect and all around interest anything yet attempted by the Society.

A Legitimate Function

The salesman must remember that he has a legitimate function to perform, and that there is no article of merchandise in this world which does not require sales effort. We all know how vitally necessary life insurance is, yet think of the effort spent in selling it.



—Cut Courtesy Contact

The Secret of Successful Retailing

It is not unusual to hear a merchant say "My business was very good last year. My receipts were $100,000 and my average inventory $25,000, so I have turned my stock over four times." This is a very common mistake, and a great many retailers delude themselves by figuring turnover in this manner.

The annual receips should never be considered the basis for figuring turnover. The real basis is the cost of the goods sold divided by the average inventory. The quickest way is to take the average markup figure, subtract it from the total receipts and then divide by the average inventory.

Where Markup is 40%

Take the case of the merchant mentioned above as an example. If this merchant's sales were $100,000 and his average markup, say, 40%, the cost of the goods he sold must have been $60,000. Dividing this amount by $25,000, the average inventory, it is found that the stock was turned over only a little over two times, and not four times, as the merchant believed.

This method of figuring will give you the correct rate of turnover on all your goods collectively, but in order to find out which are the most profitable lines, turnover should be figured on each line separately. You will find that on one line you may be getting a large turnover, while on another the turnover is very small. If you figure turnover on all your lines together, the unprofitable ones are hidden, and you also get a wrong estimate on the profitable lines.

Shelf Room is Valuable

A slow turnover is very expensive, because it involves not only your investment and interest charges, but your prestige and reputation are affected as well. Money which is tied up in slow moving goods cannot be put into other lines which would sell quickly and would boost your trade. Furthermore, you cannot keep your stock up-to-the-minute if part of it moves very slowly. Shelf room is also very valuable and you cannot afford to have it taken up by slow moving goods. Without realizing it, many retailers are constantly bringing down their rate of turnover because of large stocks of goods on their shelves which either do not sell at all, or sell so rarely as to make them very unprofitable.

Co-operation of Personnel

As a rule, a large turnover is secured by careful purchasing of goods that will sell readily,

combined with the co-operation of the personnel in pushing slow lines, and in taking a careful inventory.

Large turnovers are, of course, not the only secret of successful retailing. Profits are based on a careful adjustment of the rate of turnover with the selling price. The price at which an article can be sold should be automatically determined by the purchase price, its share in the overhead and selling expense, and last but not least, the rate of turnover—Light Touches.

How Does Turnover Affect Net Profit?

As income tax time rolls around each year we face facts—business facts, pleasant or unpleasant. I have two friends, Let's call them Bill and Frank—each runs an electrical store and they happen to have about the same amount of assets as shown by the income tax statement was made. Bill has a large store and a tion with each just after the income tax statement was made. Bill ha sa large store and a large stock of merchandise, but he drives a second-hand Ford of ancient vintage and he seems always just two jumps ahead of the credit man from his wholesaler. Frank has a smaller store, smaller stock or merchandise—but he drives a 6 cylinder limousine.

Lase year Bill's statement read like this:—

Bill's Statement

Gross merchandise sales	$40,000
Gross profit	12,000
Gross expense	11,200
Net profit	800
Cost of goods sold	28,000
Average merchandise investment	10,000

Rate of merchandise turnover—2 8/10 times per year.

Interest earned on merchandise investment —8%.

You note Bill has 10,000 hard dollars tied up in merchandise—and a second-hand Ford.

Frank showed his statement, which was identical with Bill's in one respect, viz.—sales $40,000. Here the similarity ends, but to make a comparison I'll use Bill's expense item and gross profit in Frank's statement.

Frank's Statement

Gross merchandise sales	40,000
Bill's gross profit	12,000
Bill's gross expense	11,200

"It may be laid down as a principle in all merchandising that if there is to be any volume, the customer must pay enough more than the producer's cost to defray all of the costs of merchandising, distributing and collecting for the merchandise, which all of the agencies essential to the merchandising and distributing may incur in the placing of commodities in the hands of the consumers, plus a reasonable profit to these various agencies, and regardless of how useful the articles may be, it is doubtful whether there will ever be a widespread distribution unless such a margin exists."—John F. Gilchrist.

Net profit	800
Cost of goods sold	28,000
Average merchandise investment	5,000

Rate of merchandise turnover—5 6/10 times per year.

Interest earned on merchandise investment —16%.

As a matter of fact when compared Frank's business had one item of profit not found in Bill's statement—discount. The $5,000 difference in average merchandise investment increased the rate of merchandise turnover from 2 8/10 to 5 6/10 times per year and the capital related enabled Frank to discount his bills.

Frank pays less fire insurance than Bill, loses less glassware through breakage, pays a smaller personal property tax, loses less through depreciation, loses less because of merchandise becoming obsolete, takes a smaller loss through fluctuations in price.

All of which decreases his expense of doing business and increases his net profit so that he actually made more than $800.00, but he turns his merchandise over 5 6/10 times per year and he discounts his bills.

A Checking Service Brings Business

Many customers would appreciate a place to check parcels, wraps, umbrellas, and other impedimenta. The merchant often takes charge of such things but makes no effort to increase his accommodation by offering the service, instead of waiting to be asked for it. A merchant in an eastern county advertises this service to his out-of-town customers and finds it brings him much business. People who are placed under obligation often feel that they should return the merchant something for his kindness—and they buy.

How We Sell Electric Ranges

Advantages in Saving of Food Stuffs and Cheapness of Operation—Citizens Quick to See Its Usefulness.

By J. H. WARREN*

The advantages of electric cooking are so great that they can all be realized, only by actual experience, and I will try to give a slight idea of some of the reasons. These reasons are commonly used by salesmen of the North Shore Power Company.

Because of the saving in food stuffs there is economy. The saving, because of less shrinkage in meat best demonstrates this fact. Actual laboratory tests show that loss in weight in meat cooked by fuel to be 20% greater than when cooked by electricity.

What of it—Just this:—

Supposing your meat bill averages $3.00 per week, which is a reasonable amount for the average family, you expend $156.00 per year, and if you save 20% by electric cooking you have conserved over $31.00 of food value in your meat bill alone. It is really more than this amount because of the fact that the very richest and most nourishing juices are carried off. Laboratory tests that were conducted to determine shrinkage in meats will be of interest.

A beef rib roast weighing 5 lbs. 7 oz. before cooking, weighed 3 lbs. 12 oz. after cooking in a coal range—a loss of 31% in weight. A similar roast, weighing 9 lb. 10 oz. before cooking, was after cooking in an electric range found to weigh 7 lbs. 6 oz. or a loss of only 18%. A leg of mutton showed a loss of 32% on a coal range, 27% on gas and 15% only on an electric range. This saving in the retention of the juices, etc., is so great as to really more than pay for the appliance within a very short time.

Simple in Operation

No other cooking device is as simple in operation or as easy to handle. Any desired heat can be quickly obtained by a turn of the switch. There is no fuel to order, store or worry about; no coal nor wood to carry; no matches to scratch; no fire to build nor watch; no flue to operate and no ashes to dump. It does away with the coal bin, chimney and ash pan.

It makes for healthfulness in that the person cooking with electricity is not in danger from colds or other illness caused from over-heating the body. It also helps very materially in solving the servant problem, due to its convenience and comparatively low cost of operation.

It was in the Spring of the year 1916 that the North Shore Power Company opened a demonstration room in the Power Building on the 1st floor and had on exhibition a complete line of electric ranges, water heaters and appliances.

Our citizens were very quick to see the economy and advantages of using electricity for cooking and at the end of 1922 the following ranges were installed on the lines:

Growth of Ranges in Three Rivers

1916 — A total of			39	Ranges and		9	Water	Heaters
1917 — "	"	"	110	"	"	42	"	"
1918 — "	"	"	192	"	"	56	"	"
1919 — "	"	"	308	"	"	82	"	"
1920 — "	"	"	429	"	"	143	"	"
1922 — "	"	"	593	"	"	231	"	"

At present there are about 3,600 houses in Three Rivers and there is one range to every six houses.

The rate, 2¼c per kw.h. on the meter, makes cooking wonderfully economical, and it is at the same time quick and clean. The cost of operating an electric range is now no longer an expensive luxury, but is within the reach of every one.

The accompanying table is a statement of the cost of operation for twelve average customers having

* Commercial Supervisor, North Shore Power Company, Three Rivers, Que.

Cost of Operation of Twelve Typical Electrical Ranges in Service During Year 1921. Rate 2¼c kw.h. Minimum $1.00 month. Less 10% 10 days

kw.h.	Ranges in Service during Year 1921. Minimum $1.00 month. Less 10% 10 days.	Kw.h. Rate	Rate 2¼c Kw.h. Consumed	Gross Total Income	Average Monthly Bill	Average kw.h. Consumed Monthly	No. persons family	Average kw.h. per person
No. 1	2 burner	2¼c	271	$15.32	$1.15	23	3	8
2	2 burner	2¼c	1,970	44.33	3.32	164	4	41
3	2 burner	2¼c	2,404	54.09	4.06	200	5	40
4	2 burner	2¼c	2,652	59.67	4.47	221	4	55
5	3 burner	2¼c	3,570	80.33	6.02	298	3	99
6	3 burner	2¼c	2,198	49.45	3.71	183	4	46
7	3 burner	2¼c	4,083	91.87	6.89	340	5	68
8	3 burner	2¼c	1,924	43.29	3.25	160	5	32
9	4 burner	2¼c	2,613	58.79	4.41	218	4	55
10	4 burner	2¼c	3,829	86.15	6.46	319	5	64
11	4 burner	2¼c	3,398	76.45	5.73	283	6	47
12	4 burner	2¼c	3,540	79.64	5.98	295	7	42
			32,452	$739.39	$4.55		55	

anywhere from 3 to 7 people in the family.

From present indications it looks as if this year there will be more people than every buying electric ranges.

Cooking Cost

The majority of burners on an electric range consume either 1500 watts or 1000 watts if burning steady for one hour. If you use the 1000 watt burner for one hour steady at the cooking rate it will cost you 2¼c cents. If you use the 1500 watt burner for one hour steady at the cooking rate it will cost you 3⅜ cents. All less 10% discount. If the above burners are used for one half hour only, the cost will be one half the above mentioned amounts.

Monthly Averages

1 Range
1 Month operating
4.7 Persons average family
225 Kw.h. consumption
$4.55 Monthly bill

49 Kw.h. consumed per person per month.

To-day Three Rivers is the leading electrical city in the Province of Quebec; the amount of power used per inhabitant for industrial purposes being nearly three times that used in any other city in the province.

We have the best street lighting system, the most modern street car system and **every mill and factory operates electrically.** In fact with the Shawinigan service rendered by the North Shore Power Company, life has been made much more pleasant and industry many times more productive.

In line with electrical developments the North Shore Power Company wishing to give the citizens the most modern service in their homes, carry the most up-to-date electrical appliances. This is bringing modern efficiency into the household in the form of the electrical servant and for many it means the solution of the servant problem.

A Relay Handbook

The Relay Sub-Committee of the N.E.L.A. Electrical Apparatus Committee has collaborated with the Relay Sub-Committee of the A.I.E.E. Protective Devices Committee in the preparation of a relay hand-book. This hand-book, comprising about a thousand pages, amply illustrated and systematically arranged and cross indexed, will be available for a nominal sum. The work will cover all those methods and schemes which have stood the test of time and will include many relatively new and active subjects which have received particular study, the more important of which are:—Protection of Transformer Banks; Protection of High Voltage Underground Cable; Split Conductor System—Study of Uses and Merits; Application of Relays to Automatic and Remote Control Stations; Use of Low Voltage Relays in Connection with Motor Installations for Industrial Plants; Experience with Reverse Phase Relays; Faulty Operation Due to Design of Contacts or Correlated parts; Standardization of Relay Symbols for Simplification of Wiring Diagrams; Discussion of Testing, Maintenance, and Records.

Five thousand subscriptions are necessary before the book can go to press. Make application to C. H. Sanderson, Chairman Relay Committee, Irving Place and 15th St., New York.

Plenty of Enthusiasm

The following strong plea for hydro-electric development was clipped from an Eastern paper. It speaks for itself:

Electricity Along St. Mary's Bay

Why not? Are we not worthy of it? We have natural sources enough to have at least three dynamoes that would give a voltage strong enough to illuminate all the villages from Yarmouth to Digby. What a great utility it would be to have all our churches, our convents, our hotels, our houses, and the roads all lighted with electric lights and that would cost less than any other source of light! Salmon River, Meteghan, and Sissiboo Falls are sufficient to give all the power needed to run the dynamoes because these rivers never dry up, the water of the sea goes right to their sources and with the aid of dams water can be retained for power with very little work.

These are only a few suggestions to the many Acadian villages of St. Mary's Bay. I hope that the project will be tried and if any one wishes to inspect the rivers he will be welcome at any time.

Now that we have good roads it is still more pleasant and certainly a very fine trip from Digby to Yarmouth. So let us work hard and have electric lights and possibly street cars from Yarmouth to Digby. It is done in Halifax, Yarmouth and in many other places, so let us all join together and act as one and we will have what is desired by all those who are interested in progress of the Acadians. Hurrah! for the Acadians.

Construction Notes

New flume and repairs to dam costing $20,000 is work recently undertaken by Knight Bros. Co. at Burks Falls, Ont. J. S. Parker is engineer-in-charge.

Sinclair Construction Company are doing the work on power house, foundations and tailrace for the power house at Dam No. 8, Trent River. Concrete work is being done by R. S. and J. H. Henderson, 832 Weston Road, Toronto.

A dam is being erected at Canada Hill, N. S., to develop water power sufficient to light the town of Lockport.

Power was turned on at Lorrain Consolidated on Aug. 1. This will enable management to proceed with de-watering of mine, a process which will probably take a couple of weeks. After that, it is proposed to proceed with development work.

Winnipeg Electric Home Reflects True Western Enterprise

Under Auspices of Manitoba Electrical Association, Careful Plans Guarantee a Successful Exhibition — Designers Had to Anticipate Many Needs — Wiring By Bid

Winnipeg is to have its first "Electrical Home" and from present indications it will be completed and shown in August.

The Manitoba Electrical Association conceived the idea and after due consideration appointed the "Home Committee" consisting of Messrs. Geo. Wright, John Lowry, L. B. Dickson, A. McFadyen, H. C. Howard, M. E. Deering, L. Cochrane, Geo. Brown and F. H. Martin.

This committee is working hard to make a success of the project and with the unanimous support of the Electrical Contractor-Dealers' Association and many other organizations and individuals the "Home" promises to rank favorably with others built in U. S. and Canada.

The subject of wiring was one of the first to be studied and the contractor-dealers were asked to submit plans for some. The dealers delegated two members, who wrote the specification and planned the wiring in a manner that would convey to the public the idea of a complete and convenient installation of wiring. Their endeavor was to stress in every way possible the necessity of provision for present and future needs. It should be borne in mind that change of ownership or tenants in houses demands careful preparation for varied requirements, then too, with the rapid progress in electrical equipment there should never be a lack of outlets where they may be required.

Wiring Installation

The wiring installation or the extent of facilities for using lighting fixtures and appliances is the "Yardstick by which the field for the sale of these articles may be measured" to a large extent. One of the greatest factors in breaking down sales resistance is to have the wiring installation working for us. With those convenient outlets inviting Mrs. Housewife to bring home a vacuum cleaner or a portable lamp, fan or the many other desirable things electrical, it surely behooves us to boost for better wiring.

Compared to previous Homes in other places, this is wired a little better than average considering the size. The designers had to anticipate all the fixtures and appliances that might be exhibited, also provide for fans for cooling the Home as the weather in August is hot even in Winnipeg. A signal system was installed for use of traffic supervisor in timing visitors during their inspection of the home. About ten are shown through each room at one time and they are moved every three minutes upon receipt of signals. The system consists of pear push and long cord at front door which rings watchcase buzzers in each room simultaneously. The wiring for this system is concealed and will be cut off and left after the exhibit.

The service is to be 110-220 volt, 3 wire, single phase and consists of 3 No. 2/0 Cables in conduit. Ample capacity is provided for lighting and heating circuits also for the eventual use of complete electric heating in the Home. The service is carried down the pole from supply line under-ground, across the backyard into the rear of the basement. On the interior of basement wall a 400 ampere externally operated switch is installed, which controls the entire load. Provision is made for metering light and heat separately and water heater distribution, which is all in steel boxes in the basement.

Some of the Outlets Provided

There is an index showing location of each circuit. All two wire circuits less than 30 amperes are fed from fibre-lined, metal covered, dead front cutouts. Circuits over 30 amperes or of three wires are fed from externally operated switches. Wires are carried to these through metal wiring gutters. Each cutout or switch is labelled to show proper size fuse to be used. There is an emergency fuse cabinet containing complete set of spare refills for fuses, all fuses being the renewable type. Some of the outlets provided are for wired furniture, kitchen ventilating fan, range, water heater, laundry hotplate, electric refrigerator, ice cream freezer, washer, ironer (motor driven and electrically heated,) motor for work bench, air heaters in principal rooms, illuminated house number, etc. There is also an outlet for radio set including ground and aerial connections.

The outlets wired for on the lighting system alone are as follows:

Ceiling lights 33; bracket lights 27; single pole wall switches 24; three way switches 5 (pairs); door opener switches 5; flush wall receptacles: single 25; duplex 15.

Private telephone system from owner's bedrom to kitchen is provided. Public phones are wired for in principal rooms and arranged for connection of por-

table phone. Annunciator is provided in kitchen with buttons at doors and in principal rooms also dining room floor push with table extension, annunciator is operated from bell ringing transformer connected to lighting circuit. Air heaters in principal rooms are connected to 20 ampere flush receptacles and fed by No. 12, 2 wire circuits. The lighting system includes elexits in principal rooms on fixture outlets so fixture or brackets may be moved at will by owner. Loom outlet boxes are used on lights in other rooms.

Switches

Switches are all tumbler indicating type. Coat cupboards have door switches which operate by opening the door. Pull chain receptacles will be used so that cupboard door may be left open for airing without light burning. There are pilot lights on all electric irons and on switch at head of cellar stairs for cellar lights.

Wall and floor plugs are T slot type, many being duplex, these will provide for many small appliances, also portable lamps, sewing machine, curling irons, etc. The Home contains 8 rooms and belongs to the building firm of Brown & Matthews, who loaned it for the occasion. The additional cost of wiring, also advertising expense, is taken care of by the Association.

Exhibiting the Home will require about 100 assistants, who will be members of the Association. It is expected that at least 20,000 people will be conducted through during the exhibit. The wiring was let by contract to the lowest bidder in the Association and is being supervised by the Association.

Free Repairs for One Week

A "Free Repair Week" is one of the business stimulators recently carried out in British Columbia under the auspices of the Electrical Service League. The campaign was staged on the lower mainland and twenty contractor-dealers from New Westminster, Point Grey, West Vancouver, North Vancouver and Vancouver co-operated.

An average of fifty appliances was repaired by each contractor-dealer during the campaign, and every man reported sufficient increase in sales to carry the cost of labor and parts furnished free. Before the campaign started the following agreement was signed by the co-operating firms:

Agreement

It is proposed that the contractor-dealers co-operating with the power company, hold a Free Repair Week from April 2 to 7.

During this time repairs to the following appliances will be made on a basis of free labor. Replacements, parts, etc., in value exceeding 25 cents will be charged for at retail prices.

The appliances to be repaired free are: grills, toasters, toaster-stoves, chafing dishes, hot plates, disk stoves, irons, percolators, waffle irons, heaters, immersion heaters, curling irons, shaving mugs, and milk warmers.

Newspaper advertising for this Free Repair Week will be paid for by the power company. Such advertising will contain not only the propaganda for Free Repair Week, the articles to be repaired, but also the names of the cooperating firms. Suitable window cards will be furnished by the central station to cooperating



FREE REPAIR WEEK

April 2 to 7

Don't let your electrical appliances lie on the shelves simply for want of some trifling repair.

Bring them to any of the electrical dealers named below during Free Repair Week and have them fixed.

NO LABOR CHARGE NO CONDITIONS

Materials or parts costing 25 cents or less, used in making repairs, will be free

The following appliances are included in this offer:

Chafing Dishes	Disk Stoves	Hot Plates
Curling Irons	Grills	Immersion Heaters
Milk Warmers	Heaters	Irons
Shaving Mugs	Percolators	Toasters
Waffle Irons		Toaster Stoves

Offer good only during Free Repair Week, April 2-7

Electric Supply & Contracting Co., 581 Granville St	Wallace Electric Co., 919 Granville St	F. F. Letts, 3044 Granville St
Jarvis Electric Co. Limited, 870 Richards St.	The Electric Shop, Ambleside Wharf, West Vancouver.	Muir Electric Co. 414 Hastings St. W.
W. A. Kruse & Co. 412 Abbott St.		P. G. Electric, 2181 West Forty-first Ave., Kerrisdale
Main Electric, 247 Hastings St. E.	C. Moulton, 704 Columbia St. N.W.	J. C. Beaton 411 Howe St.
Perry Electric, 585 Robson St.	Graham Electric Co., 929 Pender St. W.	Universal Electric Co., 1517 Broadway W.
Rankin & Cherrill, 55 Hastings St. W.	Jenkins Electrical Co. Limited 146 Main St.	North Shore Electric, 123 Lonsdale Avenue, North Vancouver
The Electric Shop, 32 Hastings St. E.		Hume & Trumble, 647 Columbia St., N.W.

And any B.C. Electric showroom in Vancouver, North Vancouver and New Westminster

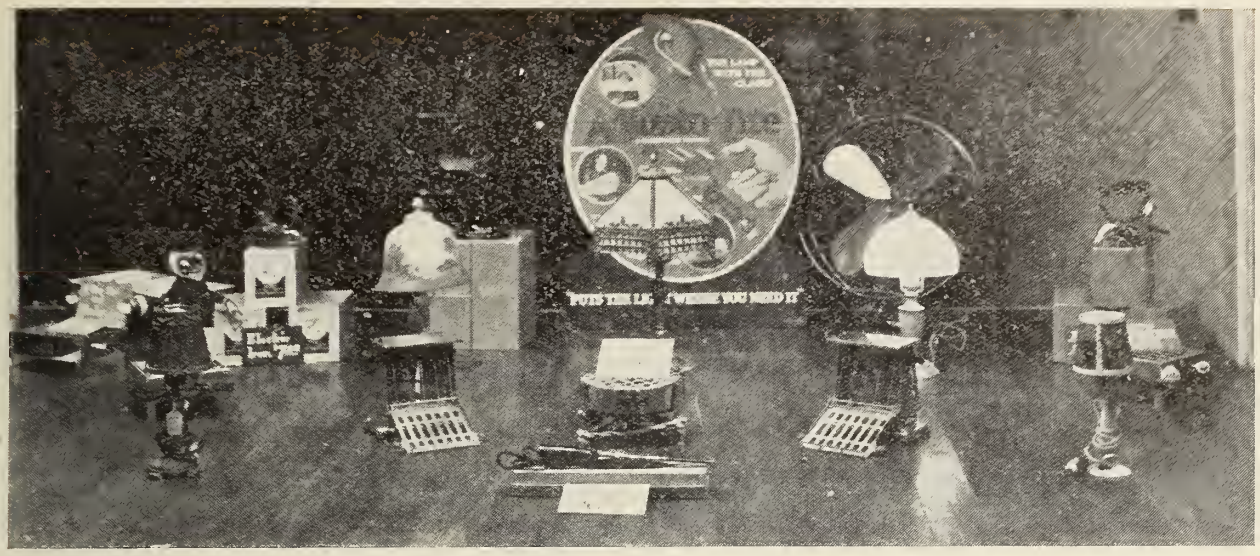
This space donated to Free Repair Week by the British Columbia Electric Railway Company

firms, announcing that free repairs may be had at these establishments.

We the undersigned agree to co-operate with the central station in the Free Repair Week outlined above and agree to furnish free labor, but to charge retail price for replaced parts in value exceeding 25 cents.

Plenty of newspaper advertising space was used, of which the accompanying advertisement is a sample. Results secured included the placing of more appliances on the lines, and for the dealers, the obtaining of good prospect lists.

J. N. Cartier, of station CKAC, La Presse, Montreal, will shortly undertake the task of making over one hundred gramophone records for a school of correspondence, giving French and English lessons with the aid of talking records.



A recent window in the Hyglo store

"Every Customer Satisfied"

J. S. Harvey Cashes in on His Opportunity by "Selling 'em Right" — A Policy That Makes the Business Grow — Washers Sold on Instalment Plan —Good Stock Selection

Every now and then some aggressive man strengthens our belief that business ought to stay normal in summer time. The latest demonstrator of this idea is J. S. Harvey, proprietor of the Hyglo Electric, 2021 Yonge Street, Toronto. He is busy all day long, in the hottest summer weather.

A Good Window

About the first thing that strikes an observer of the Hyglo store is its clean, well-lighted, well-dressed window. It runs across the full front of the store, about 20 feet, less the width of a single door. Lighting is accomplished by ten 150 watt lamps with Holophane reflectors and the result is an intensity that properly illuminates the goods. The name of the store appears on the upper part of the window, high enough so as never to interfere with a view of the display. The interior is about 20 feet wide and a little over twice as deep. Samples of washing machines, ranges and vacuum cleaners are arranged near the front, and are so placed that there is plenty of space around each one. One table is devoted entirely to table stoves, toasters, grills and such like, and each article is plainly marked with a price ticket. Radio supplies, lamps and various sundries are sold over a counter located on one side of the store.

Mr. Harvey has a good assortment of shades and fixtures. These latter are hung from the ceiling, and though many styles are shown, there is no suggestion of overcrowding. Assembling is done in a workshop at the rear.

Outside work of various kinds takes up a great deal of the proprietor's time, and he finds his car very useful. During his absence the store is looked after by a young lady who has had good experience on electrical goods. She knows the stock thoroughly and is besides a good washing machine demonstrator, so there is always somebody on hand that can take care of customers.

Business Policies

Some of Mr. Harvey's policies may be listed as follows:

1. Change window every week, generally on Thursday morning. Everything is changed, even the color of the decorations.

2. Keep a good assortment, and if it ever happens a customer wants something you haven't got, explain that you can get it the same day.

3. Sell your customers so they will come back to you. This applies to repair jobs, wiring or anything that is done.

Other points that point to the right idea of merchandising, is the practice of renting cleaners, and the selling of washers on the instalment plan.

Mr. Harvey has just been a year in this stand, having branched into it from the electrical contracting business, but he is certainly going ahead.

It is proposed to erect the transmission line of the Quinze Power Company at the rate of about a mile a day. 1,000 men will be employed. C. H. Goodall is in charge of the job.

"I Want To Learn the Business and Become a Partner"

An Article that Reveals Why Some Electrical Men Are Not Making Money

A merchant advertised for a young man to wait on the trade. The usual grist of good, fair and indifferent applications appeared the next morning. Three survived until the final sifting. To each of these the merchant put this final question:

"What do you want?"

The first applicant leaped at the question as though it might get lost in future conversation.

"Twenty dollars a week and a raise in three months."

The second was not so eager.

"What I want most is experience. So I guess fifteen dollars is enough for me. I'm not sure that I want to stay in the business long."

When the third boy was reached he replied:

"I want to know the business so well that some day I may be your partner."

The type of young man represented by the third applicant is the type who is doing more towards keeping the electrical business on the up-grade than a dozen artificial trade booms.

The Neck of the Bottle

Very wise economists tell us that distribution is the neck to the bottle of prosperity. Reduce the costs of distribution and you will bring greater prosperity to all.

They tell us that the new type of electrical dealer with his greater knowledge of salesmanship; his implicit reliance on the cold facts and figures of his business as against aimless guesswork; and his right-about face to the first principle of successful retailing, "a short profit and a quick turnover" is cutting distribution costs and filling in the valleys of business cycles.

This is the golden age for the young man wishing to learn the science of store-keeping—for it is a science. The opportunities were never richer. And yet he must work and study as the old type of store-keeper never did.

Guessing Along

It used to be true that "most anybody can keep store," as the saying was. If a man failed in farming or got tired of working for someone else, he usually set up a store and began to dispense goods. It never occurred to him that special training and skill were needed to buy and sell at a profit. From the day he first thought of store-keeping as a life calling, he began his guessing. He guessed that he wasn't cut out for a farmer and that he might as well go to store-keeping. He guessed that he would rent or buy such and such a location. He guessed that he would handle this and that merchandise. He guessed that long profits on slow moving merchandise beat short profits on fast movers.

He guessed that Henry was a good clerk and Oswald wasn't. He guessed that Sol Wuester owed him sixteen dollars and forty-six cents and he guessed that Sol had been owing it to him for six months or more. He guessed from morning to night. He would no more think of spending a half hour in the morning gathering the figures about the previous day's transactions and learning the actual facts first hand than he would think of buying goods from his meanest competitor.

There used to be a lot of guessing among store-keepers in the old days. There is still too much of it being done. When the government collected the first income tax, there were only a small percentage of retail merchants who made out correct returns. Conditions were still bad in 1922. Undoubtedly, if a close investigation were made of the merchants who failed last year the facts would show that more than 75% of the failures were due to guessing.

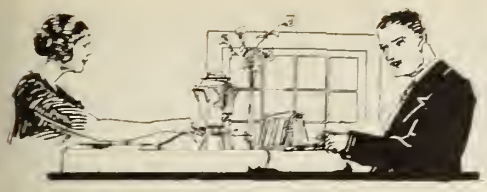
An Up-to-date Electrical Dealer

The up-to-date electrical dealer today is a fact-finder and a fact-user.

Every day he gets the whole story of his business in figures. His books show him what goods move fast and what goods loll around the floors wasting space and money. He knows who owes him money and how much. On short notice this up-to-date merchant of ours can prepare a financial statement that his banker or wholesaler will accept as a basis for negotiating a credit extension.

When this up-to-date merchant in turn employs new sales clerks he knows from the first how much the young men or women are earning; what percentage of each sales dollar goes into selling expense; how close each clerk comes to selling enough volume to earn his salary; what goods they sell best; how well informed they are about the goods they are selling.

Every merchant today has a place for the young man who "wants to know the business and some day be a partner in it;" who enters his new employment with the idea that he is to become a part of it—loyal, courteous, honest and intelligent.



Make Toast Your Breakfast Food

A Campaign of Education That Got Everybody Boosting for Electric Toasters

By REY E. CHATFIELD*

Toast used as a breakfast food increases the consumption of bread in a home. This fact has been pointed out to all members of the American Bakers Association as well as the fact that an electric toaster makes toast better than any other toasting device. The Association has also pointed out to its members the possibilities of increasing the sale of bread by co-operating with the electrical dealers to place more electrical toasters in the homes.

With this as a working basis a local baking firm, Shelly Bros., co-operated with the Electrical Service League of British Columbia in a campaign to put an electrical toaster in every home. While the goal of a toaster in every home has not been reached the campaign has increased the sale of toasters greatly.

Through the bakery wagon drivers an attractive circular was distributed with every loaf of bread sold, just prior to the opening of the campaign. This circular stressed the food value of toast as a breakfast food and the convenience of making toast electrically.

Bakers Sold Toasters

During the two weeks the campaign ran every driver was given standard toasters to place on free trial along his route. These toasters were furnished the bakery firm by the local jobbers and were sold at list price. The driver was allowed seventy-five cents commission on each sale and the difference between the list price less commission to the driver and wholesale price was turned over to the local association of Electragists, International, for distribution to dealers.

> **Sales channels of least resistance lie open to the salesman who demonstrates his product in the simplest manner to the non-technical class who have their own way of thinking and will continue to follow it.—L. W. Staunten.**

Every dealer featured toasters in his window displays. Display cards and window streamers were furnished dealers by the League; the Sunmaid Raisin Company also furnished attractive display cards to the dealers.

The publicity campaign starting with the circulars distributed to the consumers, included daily advertisements in the newspapers and street car cards.

Manufacturers and the central station featured toasters in their street car and newspaper advertising. One manufacturer also sent out a large number of direct mail advertising letters.

Make Toast your Breakfast Food

The campaign attracted not only the attention of other bakeries but also of hardware and department stores so that the slogan "Make Toast your Breakfast Food" was brought to the attention of the public from many sources. What is most important, however, to the electrical industry is the fact that toaster sales were very greatly increased. The housewives who tried out the electric toasters and did not buy during the campaign are certainly good prospects for toasters and other appliances in the future.

*Secretary-manager, Electric Service League of B.C.

H. S. (Bert) Quigley Changes His Location

Mr. H. S. Quigley has been appointed Toronto and Hamilton representative of Jefferson Glass Company, Ltd., with headquarters at No. 364 Bay Street, Toronto. Mr. Quigley has been with MacBeth-Evans Glass Company for some time. He is exceptionally well-known to the electrical trade and will undoubtedly continue to serve his old customers at the Jefferson, Toronto, show-rooms.

Porter and Clarke on Yonge Street

Porter & Clarke, electrical engineers and contractors, and known as "Electric Service Shop," at 786 Annette Street, have purchased the electric business of J. F. Calverley, 2603 Yonge Street, Toronto. This will be carried on in addition to their Annette St. business. Mr. Porter was formerly in business at 2 Toronto St.

Bowser & Son, Amherst, N. S.

W. B. Bowser & Son, electrical contractors and dealers have lately moved from Havelock Street, Amherst, N. S., to 119 Victoria Street, into premises far better suited to their business. They have bright show rooms with good display window for fixtures.

E. W. Myers Co. Making Radio Vacuum Tubes in Montreal

The E. B. Myers Company Limited has installed machinery and commenced the manufacture of Radio Vacuum Tubes at 240 Craig Street, West, Montreal. Mr. Myers' name is well known in the radio field. It is recorded that he made the first audion tube in America and was the first to use the galena crystal as a detector. While acting as engineer for Dr. DeForest he designed the present audiotron tube and equipped the first audion manufacturing plant in America; Dr. DeForest paying him a royalty of 30 cents per tube. As early as 1912 Mr. Myers erected and operated a high power broadcasting station at Albany, N.Y., sending out regular programs nightly. The great steel tower erected in New Jersey, from which the reports of the Dempsey-Carpentier fight were broadcasted, is the original tower of Mr. Myers' broad casting station.

During the war the Western Electric Company gave Mr. Myers charge of production of their "J" tubes, where he raised the output to 5,000 tubes per day. Following the war he formed his own company—the Radio Audion Company of New Jersey. Some trouble arising over the Myers patents in the United States, which prohibits the manufacture of these tubes until 1925, Mr. Myers has come to Canada and been granted patents for Audion construction, with other patents pending.

The machinery for constructing the Myers tubes, which is now completely installed in the plant in Montreal, is said to be very complete. Mr. Myers states that he has recently made great improvements in the art of manufacture of radio vacuum tubes which are now being embodied in his products.

Mr. Myers, though not a Canadian himself, has a high appreciation of Canada. He married Miss Vida Rousseau, a native of the Province of Quebec and a daughter of Mr. David Rousseau inventor of the Block Signal System now widely used in railroad work. Mr. Myers has promised us an article on the art of manufacturing radio vacuum tubes, which we hope to publish in an early issue.

E. W. Sayer Sales Corporation

The E. W. Sayer Sales Corporation is a new name on the list of Canadian electrical jobbers. They are Quebec and Maritime Agents for the Brock Snyder Manufacturing Company of Grimsby, Ontario; Eastern representatives of the Adison Supply Company, New York, and of the Holmes Manufacturing Company, manufacturers of a battery charger; also of the A. Mecky Company, Philadelphia, who make a soldering iron and a new patent toaster. They are also distributors for the Beacon Lamp and will add other agencies as opportunity arises. Mr. E. W. Sayer is very well known in Montreal where he has been in the electrical contracting business for more than a quarter of a century. At the last election he was a successful candidate for the Quebec Legislature, but he is not allowing politics to interfere with business.

Toronto Licensing By-Law at Last

After long years of endeavor on the part of the electrical contractors and workers of the city of Toronto, a by-law has now been passed licensing both electrical contractors and journeymen. The examining board has also been appointed and the Act goes into effect on October 1. The members of the Board are:—Harry Rohleder, representing the electrical contractors, George Somers, Sr., representing the electrical inspection department, and W. G. F. Price, city architect. The Board operates without remuneration.

Business Changes

Messrs. Goldsmith & Harris, formerly co-proprietors of the Electrical Housekeeping Shop, 683 St. Clair W., Toronto, have dissolved partnership. Mr. Goldsmith has now started the Runnymede Electric Shop, 2196 Bloor West, while Mr. Harris continues under the same name at the old stand.

Edward Mireault, Montreal, has registered a business under the name "Electrical Merchandising."

The Coleman Electric Co. has been registered at 21 Dundas St. East, Toronto.

The Wright Electrical Co., Ltd., has been registered in Montreal.

What Prospect Is Interested In

Use care not to be too technical when you demonstrate. Remember your average prospect is not interested in aught else but the common facts and basic principles, so be pointed and concise in your methods.

New Polyphase Motors

The Robbins & Myers Company, Springfield, Ohio, manufacturers of electric motors, generators and fans, have gone into production and are now marketing their new Type "L" polyphase motors. The motors will be made in a large range of sizes from 15 h.p. to 150 h.p. Many features are claimed for them, including a method of ventilation which enables the motor parts to be constantly bathed with cool air; higher power factors; improved starting torque; bearings that are dust-proof; reversible terminal box with cover removable; and sizes and weights considerably decreased with added rigidity and strength. Bulletin No. 135 giving details of this line of motors can be had on request to the manufacturers.

Doesn't It Happen Every Day?

Six Little Real-Life Anecdotes Showing Why Some Customers Bought and Some Didn't—The Lessons Taught are Applicable to Electrical Stores—They are Actual Experiences

"Do You Keep Brown Polish?"

Something or other had happened to make that clerk feel facetious. He felt good, all through, and from his position behind the counter, he beamed at the young lady who approached.

"Do you keep brown polish?" A common enough question, but in that clerk's mood, what a chance for



You can keep it

a bit of repartee! The temptation was too strong to resist, and he replied:

"We don't keep it—we sell it!" This shaft of wit was badly aimed, however. The young lady did not like it at all, and after a moment's silence replied: "Well, you can keep the box you were going to sell me." Then she swept out, leaving a crest-fallen clerk.

Buying a Two-Way Socket

My house was wired in 1903, long before I bought it. When I took possession, I felt immediate need of convenience outlets in the kitchen and decided to temporarily fill the gap with a two-way socket. Like a good many other working men, I had to buy this in the evening because my wife didn't know exactly what was required.

I set out in fine hope of getting the plug and being back inside of fifteen minutes, but I was destined to disappointment. The nearest electrical dealer's store was closed, though he was working in the back part, because I could see a light and a shadow moving around.

On to the nearest hardware store. A lad there, evidently a newcomer in the business, had never heard of the article, but obligingly let me search through a couple of drawers of various electrical sundries, with however, no result.

Then I bethought me of a man who has a little wiring office up a side street. It was a chance whether he would be there, but I took it, and found him in. He didn't have a two-way socket, but he sold me what he claimed was a comparatively new device—a plug that had a lamp outlet with also a place to plug in on each side. He is also coming around to give me a price on better wiring for the house.

The Telephone Order

It has been my experience that it is always difficult to get people in stores to give decent service over the telephone. A short time ago I was putting in my garden and phoned a store and asked about a garden spade. The clerk who answered did not know if the spade was in stock. He called another man who made me repeat my story in detail.

It is true that I eventually bought the spade there, to save the trouble of going through the process again, but it left me irritated. I believe that the first clerk should have repeated my request to the second man who came to the phone.

"There's a Fellah Here"

I went into a store the other day to have an umbrella repaired. I wanted it in a hurry and asked if it could be ready the next day at a certain hour. The salesgirl wasn't sure, so she went to a phone at another counter to find out. "There's a fellah here



There's a fellah here

wants an umbrella repaired by one o'clock to-morrow. Can ya have it for him?" I was quite within range of hearing, as she must have known very well, and while I don't stand on my dignity very much, still I felt there was either ignorance or discourtesy implied

in the use of the term "fellah." I didn't say anything about it, but I took away a bad impression of the salesgirl.

The Tale of a Trunk

My vacation time needs included a trunk. At lunch time I dropped into a little store where I remembered I had seen some nice displays of trunks and bags. The proprietor bustled up from the rear and heard my request for "a medium-priced steamer trunk." He very energetically pulled several around and opened them for my inspection—and my choice fell on a sturdy little affair with stout straps and brass fittings.

"How much?"—the price was within reach of my modest means. There was one objection, however; I do not like violent color arrangements, and the interior of that trunk was a blaze of pink and green and blue chintz.

"Have you a trunk with any other lining?", I asked him.

"You don't buy a trunk for the lining," he replied, "You don't travel with your trunk wide open.

That answer killed his sale. I told him I would look elsewhere, and walked out of the store.

"No, We Can't!"

As I passed a shop window during the recent semi-annual sales, I noticed a shirt of a kind I had been wanting marked at a reduced figure. I put my hand in my pocket and found I didn't have enough cash with me. So I went inside and asked the salesman who approached me if he could set aside a shirt for me until the next day, as I was afraid they might all be picked up in the meantime, explaining my reason for making the request.

"No, we can't," he said. Then, "what size do you take?"

"Fifteen," I replied.

"Well, you can get one to-morrow—they won't be all sold out," he told me.

The man didn't mean to be discourteous, but his blunt "No, we can't" was a bit jarring, and I thought afterwards he was a pretty poor salesman to say "No" to a customer when it was quite unnecessary. He could have easily asked me to come back the next day, without any refusal in the first place.

Putting Profit In Contracting

Low Bids, Wrong Labor Items and Gambling on Extras had New York Contractors in a Bad Way—The Remedies*

Some New York electrical contractors put up to me the question of what if anything could be done to bring about a better condition. They complained of the fact that the business of electrical contracting was losing its position as a money making institution due to many varying causes and rather particularly as they thought due to the fact that they themselves were putting in bids below cost.

They contended that their costs ran very close to one another, that their meetings and discussions showed this to be the fact without question, but that there was always someone who put in a bid below cost, thus bringing about a condition which kept them all in competition on a less than cost basis.

I wondered when these men would wake up to the fact that going in below cost in the hope of pulling out on extras could not possibly result favorably. And so I started to gather data covering costs of estimates made.

These developed just what I had expected:

First, that the labor items were absolutely wrong and that the bulk of the difference in prices was due to lack of uniformity in labor calculations.

Second, that most of the bidders did not take overhead into consideration as part of cost, and

Third, that the gamble on extras played a most important part in the preparation of bids.

I decided to first take hold of the gamble part of the proposition. I argued that if I could make this fact public, and educate the architect and owner so that he would realize that he was in great danger of being worked along this line that it would reduce the desirability of the gamble. And so I started to broadcast this idea by a series of documents, speeches and newspaper articles, and I assure you that they have been effective.

The next question was to remedy the lack of labor uniformity and this was done by the adoption of a Manual of Estimating.

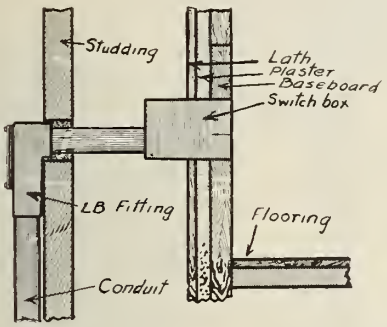
The overhead item is now under way, and headway being made both with the contractor, the architect and the owner; i.e., having all three recognize the fact that this is as much a part of cost as is conduit, wire or labor, and that if the contractor does not get these three items—Labor, Material and Overhead—in his original job the temptation to try to make them up in extras is too great to take a chance. They must understand that the contractor who is forced into a price which does not give him his cost will, despite anything that might be done to prevent him, get his on extras and that the owner is helpless to prevent it.

*Charles L. Eidlitz before Pittsfield Convention.

A Page of Practical Ideas

Extra Outlets in Old Houses

It often happens that a householder becomes sold on the "Better Wiring" idea, and wants more outlets. One way of doing this in cases where outlets are on



the outside walls, is shown in the drawing. It involves exposed conduit on the outside of the building. This runs up to an "L B" exposed fitting with cover and gasket, from which a short nipple connects to a switch-box.

Wiring in Round-houses

One of the most severe situations for wiring that can be named, is in a steam railway roundhouse. Acids are continually present in the vapor that hangs in the air, and the result is that copper or conduit is corroded in a very short space of time. It can be easily imagined that either conduit or open work are almost equally attacked; in fact, installations are generally replaced every four or five years.

A prominent contractor, with considerable experience in this type of wiring, says good results are obtained by using lead covered wires for runs to receptacles and fixtures. Protection against mechanical injury (conduit) is only used for about ten feet above floor level, but lead covered wires are used. An odd feature of these installations is that the wiring up to about six feet above floor level will be found quite good with the rest of it badly corroded. This is due to the fact that the fumes collect mostly in the upper part of the roundhouse.

Eliminating the Vacant Window

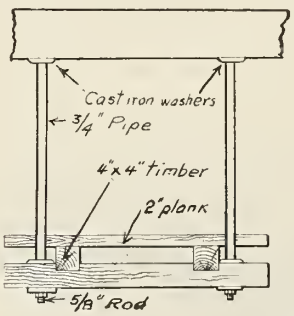
An idea that sounds promising is given by a dealer as follows: "Vacant stores make a depressing atmosphere in a neighborhood, and besides, their windows are so much good advertising going to waste. I turned the situation over in my mind, and finally decided to rent a good window in a vacant store for my own use. Some owners were not willing to rent a window that way, but I found one, and I am keeping the window full of my stuff, and well lighted. Of course, I have in it a very prominent card telling people where my store is located. It certainly has produced results."

A Test for Porcelain

Most of us do not bother very much about the quality of the porcelain we buy. As long as it looks all right we take it as it comes. However, there is one simple means of testing the porcelain—just take out your fountain pen and place a drop of ink in the cleat or knob. Note whether this small blot of ink spreads out as it would do on blotting paper, or hangs together as it would on a piece of glass.

Saving Floor Space on Motor Installation

The necessity of saving floor space sometimes renders it desirable to hang motors from the ceiling. There are various ways of doing this, and the accompanying diagram shows a plan that has produced good results. The square timbers supporting the platform are made of 4 x 4 material. The platform itself should be at least two inches thick. Suspension members are of 3/4 pipe cut to the desired length. This pipe encloses a 5/8 in. rod which runs



up through the beam above. Cast iron washers are used as shown in the drawing. If beams above are not close enough together, additional pieces will have to be set in as required.

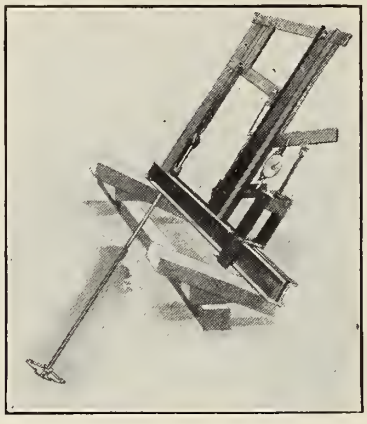
This construction is found to give all rigidity necessary for small motors. In larger sizes, braces are used from the lower end of the bolts to the ceiling.

To stop advertising during the summer months is almost equivalent to saying to your salesmen: "Relax your efforts; there is no business to be had." And whether you say it or not they are more than likely to take the hint.

The Latest Developments in Electrical Equipment

Hanson Expansion Anchor

Canadian Line Materials, Limited, Hillingdon Avenue, Toronto, Ont., are marketing an expansion anchor with several interesting features. The device is claimed to be an economical and effective guy wire



support, providing anchoring capacity up to 12,000 lbs. Two sizes, 4 in. and 8 in., with 2 and 4 blades, are regularly supplied. The accompanying illustration shows the anchor in place, with a special testing machine demonstrating how the holding power of the anchor is determined.

Slip Joint Plier and Wrench

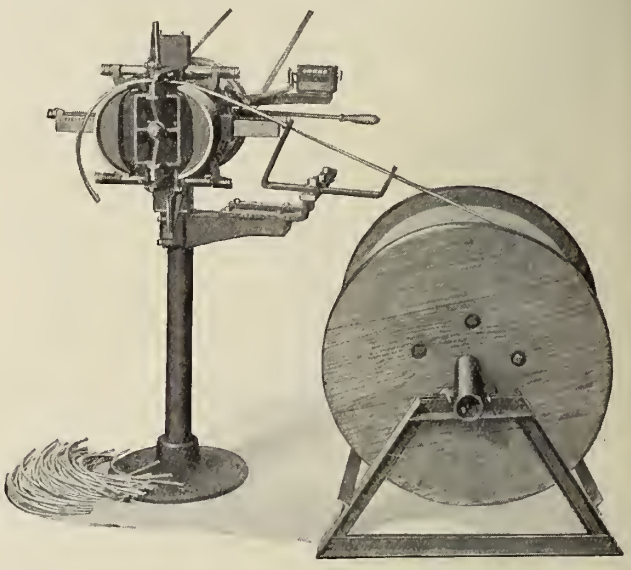
The Industrial Products Company are marketing the "Ipco-Carlson" Slip Joint Plier, as illustrated. This tool has four positions and jaws are parallel at each adjustment. The grip is obtained by pressure aplied to top handle. Slight pressure brings the jaws to a non-slip position. The tool is drop-forged



out of steel, heat treated for 8 hr. in 1800 deg. Fahr. and jaws then hardened. It is claimed that the offset design of the jaws gives the tool distinct advantages. One important advantage is the performing of work in difficult corners. It is practical for pipe work up to one-half inch, meter repair, storage battery, automatic and a range of general work.

Wire Cutting and Measuring Machine

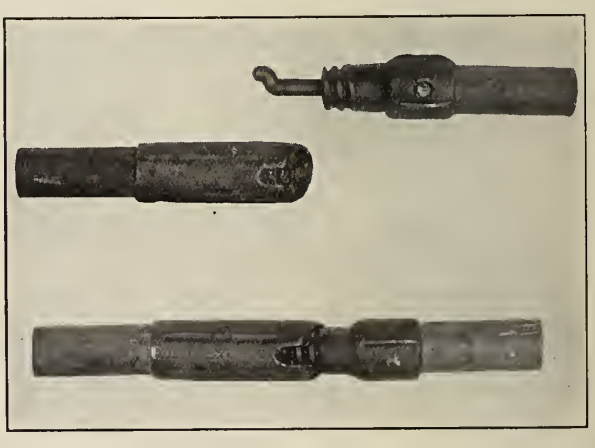
The Artos Engineering Company are manufacturing a machine that cuts heavy flexible and semi-flexible materials into lengths as desired. The cutter head on which the two knife levers, the two clamp levers and the gauge are located, turns around with the shaft. By means of slide bars, the knife and clamp levers are moved up and down in relation with the clamp base. The material is held between the clamp base and the clamp and as one of the two clamp levers is always down on the clamp base, the



material will not be released, but as the shaft rotates it will be automatically fed. The knives on the knife levers cut with a scissor effect against knife blades mounted on the base. Adjustments for length of cut are made by moving the gauge finger along the graduated gauge bar.

Conduit and Sewer Rod

W. H. Stewart has brought out a new conduit and sewer rod with a slot in the female end and an extension on the other end slightly bent to a right angle which enters this slot when rods are at a right angle. The wall is back a little way from the end and two threads screw into the slot and make the

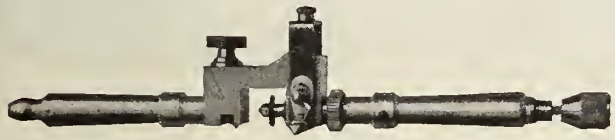


joint rigid. The rods will not come apart, it is stated, even if fully unscrewed. One advantage of this rod is the little shelf that the thread drops into, starting

itself; no cross threading or hunting around; remains started on removing hands; does not have to be held or started over again as with common screw rods.

Mica Undercutter

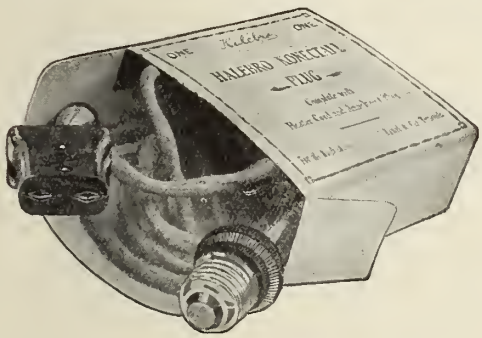
An apparatus designed for successfully undercutting commutators with a V slot, has been put on the market by the Martindale Electric Company. As shown in the illustration, the machine is grasped by the horizontal handles. Power is furnished to drive



the cutter by means of a telescoping shaft with universal joints. The actual cut is made by the milling cutter shown in the centre of the illustration, which cuts at about two inches per second. An air blast can be used through the left handle to blow away the cut mica.

Halebro Heater Plug

A conveniently packed renewal cord is being marketed by Hale Bros., 435 St. Paul West, Montreal.



It is claimed that the plug clips, which are made of selected spring brass, will not arc and that they fit perfectly either round or flat terminals.

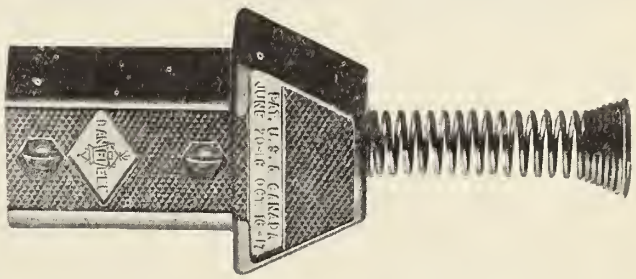
L. & N. Company Limited

The L. & N. Company Limited, St. Johns, Que., announce that they are now manufacturing armored conductors and flexible steel conduit; they are advertising their various lines in this issue, under the heading "Canadian Products." This company started business eleven years ago, under the name of the Insuladuct Manufacturing Company and made a success of their non-metallic flexible conduits Insuladuct and Loomduct. During the period of the war they experienced great difficulty in obtaining supplies of paper twine, which is used in the manufacture of non-metallic flexible conduit, and decided to instal a plant of their own. The output of this plant has grown to such an extent that the company are not only supplying all their own requirements but they are manufacturing twine and cordage for a number of Canadian concerns that use paper in the manufacture of their products. Owing to the growth of business, the company increased their capital in 1920 and changed the name to the L. & N. Company Ltd.

Up to a few years ago all the flexible conduit used in Canada was imported and when manufacturing started in this country all the duck, cotton yarn, insulating compounds and paper twine were imported from the States. Today it is possible to buy all this material in Canada and it is only a question of time until we become exporters of these materials. New methods of construction are demanding improved electrical installations and armored conductors and flexible steel conduits will be in increased demand.

Banfield Appliance Plug

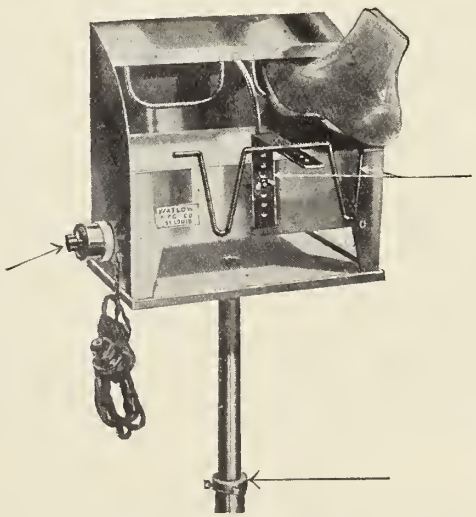
A new appliance plug has been added to the line manufactured by W. H. Banfield & Sons, Limited, 370-386 Pape Avenue, Toronto. This plug is made of bakelite, and contact members are of heavy spring



brass with flanged edges. The shape of the plug is claimed to bear additional selling point, the triangular top furnishing a convenient grip. It is pointed out that this plug can be used for either iron, toaster, or percolator.

Electric Box Toe Steamer

An electric box toe steamer, designed to be especially useful in shoe manufacturing, has been put on the market by the Watlow Electric Mfg. Co. The



device furnishes steam for the box toes which are shaped under its influence. A three-regulator switch is furnished with the machine.



Here they are in one of the prettiest little parks in Canada—at Woodbridge. See how jolly they all look

Toronto Contractor-Dealers Enjoy a Day's Outing with Their Families and Friends

To the Number of Three Hundred They Motor to Woodbridge Where Happy Smiles Replace the Business Frown

Judging by the large attendance at the first annual picnic of the Toronto District of the Ontario Association of Electrical Contractors and Dealers, there will be many more to come. Over 300 men, women and children gathered together Wednesday afternoon August 8th, at a very pretty park at Woodbridge to have a good time and forget business for the afternoon.

The first event of the day was a battle between the jobbers and contractors in the form of a ball game. It would hardly do to mention the score here or the jobbers might start in practising now or perhaps Art Wilson and his assistant umpires might disappear before this time next year.

The finances, games and prizes were looked after by the following committee: Messrs. Stocks, Chivers, Moss, Flewwelling, Davenport, Clark, Nealon, Newman, Taylor and Hicks, to whom full credit must be given for the splendid success of the event. The manufacturers and jobbers who kindly donated the prizes for the games responded most liberally. It is doubtful if a finer and more costly collection of prizes was ever donated to an event such as this. The following is a list of events, prizes and their donors. Items shown as "purchased" represent prizes purchased with money donated by companies who do not manufacture or handle merchandise suitable for prizes:

Cash Donations

Hurley Machine Company.	Devoe Electric Switch Co.
Moloney Electric Company.	Smith & Stone Ltd.
Canadian Laco Lamps.	Packard Transformer Co.
R. E. T. Pringle.	Hessco Co., Ltd.
Electrical News.	L. and N. Company.
Maxwell Limited.	Metropolitan Eng. Co.
Cole Manufacturing Co.	Crouse-Hinds Co.
Canada Wire & Cable Co.	Harvey Hubbell Co.
National Conduits Co.	Electrical Fittings Co.
Dom. Engineering Agency.	Equator Manufacturing Co.

Prize Donations

Lucky Number Contest

Prizes	Donated by
1st—Vacuum Cleaner	Northern Electric Co.
2nd—Silver Duplexalite Fix.	Base-O-Lite Co.
3rd—Coffee Percolator	Canadian General Electric
4th—Armstrong Stove	Rogers Electric Co.
5th—500 ft. Loom	Dalyte Electric Co.
6th—2 Packages Lamps	Solex Company
7th—Pocket tool set in Leather Case	purchased
8th—100 Bushings	A. L. Winston, Jr.
9th—3 year's subscription	Elec. Dealer and Contractor
10th—3 year's subscription	" "
11th—3 year's subscription	" "

Single Men's Race

1st—Adjustable Light, Port.	W. H. Banfield & Sons, Ltd
2nd—Flashlight	Dominion Battery Co.
3rd—Dim-a-Lite Portable	Benjamin Electric Co.

Fat Men's Race

1st—Table Lamp	Tallman Brass Company
2nd—Candle Fixture	Standard Bronze Company
3rd—Desk Lamp	W. A. Hall

Men over 40 Years

1st—Heatray Heater	National Electric Htg. Co.
2nd—Table lamp	Metal Studios Ltd.
3rd—Turnover Toaster	Canadian Westinghouse Co.

Dealers and Contractors

1st—Table Lamp	Walsh Electric Co.
2nd—Hot Plate	Moffat Stove Co.
3rd—Filterlite Unit	Holophane Co., Ltd.

Jobbers and Manufacturers

1st—Pipe in case	purchased
2nd—Pipe in case	purchased
3rd—Pipe in case	purchased



—everybody is happy; no thought of business competition; and as for price cutting—never again

Prizes	Donated by
Three Legged	
1st—A. Heater	Superior Electric Co.
1st—B. Heater	Renfrew Electric Co.
2nd—A. Table Lamp	Knight Bros. & Grant
2nd—B. Table Lamp	Knight Bros. & Grant
Blind Horse	
1st—Candle Fixture	J. H. Edmunds Co.
2nd—Candle Fixture	Can. Drill & Electric Box Co.
Contractors Backward	
1st—Hot Plate	McClary Mfg. Company
2nd—Heater	Factory Products Ltd.
Girls under 5 Years	
1st—Doll	purchased
2nd—Xmas Tree Outfit	Can. Drill & Elec. Box Co.
3rd—Xmas Tree Outfit	Can. Drill & Elec. Box Co.
All others in race "Large colored Balls"	purchased
Girls under 12 Years	
1st—Silver Mesh Bag	purchased
2nd—3 pair scissors in case	purchased
3rd—Leather hand bag	purchased
Single Ladies	
1st—Boudoir Iron Set	Can. General Electric Co.
2nd—Table Lamp	Toronto Electric Supply Co.
3rd—Electric Iron	Brock-Snyder Co.
Married Ladies	
1st—Work Rack	Henderson Business Systems
2nd—Silver Butter Dish	Macey Washer Co.
3rd—Silver Fork	Nerlich & Company
Ladies Egg and Spoon	
1st—Warming Pad	Square D. Company
2nd—Boudoir Iron Set	Masco Company, Ltd.
3rd—Boudoir Lamp	Masco Company, Ltd.
Boys under 5 Years	
1st—Mechanical Boat	purchased
2nd—Xmas Tree Outfit	Can. Drill & Elec. Box Co.
3rd—Xmas Tree Outfit	Can. Drill & Elec. Box Co.
Boys under 12 Years	
1st—Radio Head Set	Chas. A. Branston & Co.
2nd—Flashlight	Can. National Carbon Co.
3rd—Flashlight	Can. National Carbon Co.
Joint Splicing Contest	
1st—Waffle Iron	Masco Company, Ltd.
2nd—Lamp	Lightolier Co.
Sock Race	
1st—Bill Fold	purchased
2nd—2 pack cards in case	purchased
3rd—1 pack cards in case	purchased

Prizes	Donated by
Base Ball Game	
10 boxes cigars	Standard Underground Cable Company
Oldest Lady on Grounds	
Bead hand bag	purchased
Youngest Baby on Grounds	
Silver spoon and pusher	purchased
Girls under 9 years Race	
1st—Doll	purchased.
2nd—Barney Googles	purchased.
Boys under 9 years	
1st—Indoor ball	purchased
2nd—Indoor bat	purchased

A meeting of the Eugenia Hydro Association was recently held in Owen Sound. Plans were outlined for connecting the Eugenia and Niagara Systems by tie line from Harriston to Mount Forest and also for the construction of a pipe line at Eugenia to get the full capacity of the plant.

At a recent meeting of the Paisley, Ont., Health Committee a report recommending the installation of a 300 kilowatt electric heating unit in the Cornish and Charles St. baths, was favorably received.

Rate-payers of Kirkland Lake end of Teck Township, defeated a by-law providing for an agreement with the Northern Ontario Light & Power Co., which would have given electric light to Swastika.

The Hessco Electric Manufacturing Company has been incorporated, with head office in Toronto. Capitalization is $40,000.

James Harris, electrical contractor, Kingston, Ontario, has been awarded a recent contract for improving the lighting system in St. George's Cathedral; also the contract for wiring the new Kingston Masonic Hall.

Human Interest Clinches Radio Sales

If your town has any boating facilities you have an excellent chance to sell radio equipment. The idea of having a pleasure craft equipped with radio appeals to almost everybody.

1. Get local photographs showing boats with radio installations and use them in your window. One interesting display of this kind gives a complete list of equipment used, with each photograph.

2. A summer camping scene makes a good window display. Feature compact sets, tent, canoe and so on. The Salisbury Electric Company, Toronto, drew crowds with a window of this type.

3. Don't forget that aquatic clubs of all kinds are prospects for large sets, beside the individual outfits you may sell the members. Demonstrations are sales clinchers.

Radio Inspectors Appointed

A letter has been received by the Electrical News from Mr. C. P. Edwards, Director, Radio Service, Ottawa, giving the names of the folling radio inspectors, who have been appointed for part-time duty.

Inspector	
Atkinson, A. L.	St. John, N. B. and District
Bodie, R. C.	Vancouver, B. C. and District
Crackener, W. H.	Brandon, Man. and District
Carter, W. J. L.	Windsor, Ont. and District.
Davis, R. M.	Kingston, Ont. and District
Duncan, W. C. C.	Toronto, Ont. and District
Edwards, G. A.	North Sydney, N. S. and Dist.
Evans, A. V.	Calgary, Alta. and District
Gowan, H. S.	Kitchener, Ont. and District
Kemp, G. A.	Three Rivers, Que and Dist.
Langford, C. H.	London, Ont. and District
Lowney, R.	Sherbrooke, Que. and District
Macklem, John	Saskatoon, Sask. and District
Mitchell, W. K.	Brantford, Ont. and District
McWilliams, D. R. W.	Quebec City, Que. and Dist.
Pottle, W. R.	Moose Jaw, Sask. and District
Reid, A.	Montreal, Que. and District
Rogers, K. S.	Province of P. E. I.
Shannan, J.	Winnipeg, Man. and District
Sherwood, H. F. N.	Peterboro, Ont. and District
Sutton, Wm. M.	Ft. William and Pt. Arthur, Ont. and District
Westland, H. L. G.	Hamilton, Ont. and District

Trouble for Radio In England

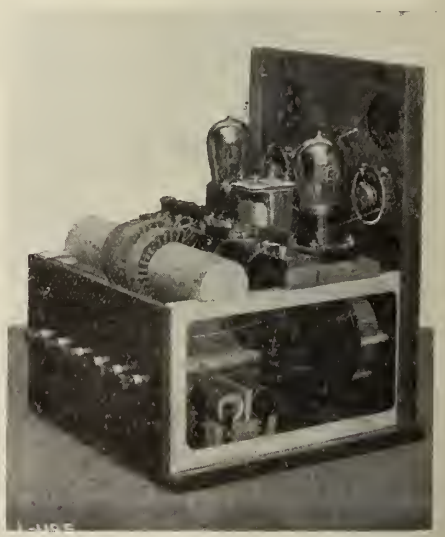
In England the Newspaper Proprietors' Association banned the publication of broadcasting programs in the daily newspapers. The manufacturers came back promptly by using daily posters which were hung up in dealers' shop windows. Although the programs have since been reinstated in the newspapers, the posters continue to be issued and are regularly used.

Hotel Radio Equipped

It will soon be possible to listen in from rooms of a large hotel in Minneapolis, which has contracted for the connection of each of several hundred rooms with radio plugs. Head phones may be rented for a small fee from the clerk's office.

The products of the Mullard Radio Valve Company, Limited, of London, England, are handled by the Radiovalve-Equipment Company, located at 85 Florence Street, at Brock Avenue Subway, Toronto.

The Diamond State Fibre Company will again display their extensive lines of electrical and miscellaneous fibre products at the Canadian National Exhibition at Toronto this year. The company will have two display booths, one in the Manufacturers' Building and the other in Machinery Hall.



A receiving instrument used by the Hydro Electric Power Commission of Ont. Watch future issues for a complete description of noteworthy installation they have made.

Current News and Notes

Aroostock, N. B.

The Maine and N. B. Power Co. has raised the roof of the Aroostock station 12 feet, has installed a new unit and has increased the height of the dam by 8 feet. When the improvements are all completed the plant will be capable of developing 9,000 h.p.

Asbestos, Que.

The Canadian Johns-Manville Co. Ltd., are excavating for a $400,000 manufacturing plant at Asbestos, Que.

Barton Township, Ont.

Barton Council recently decided to take a poll of the people on the question of increasing the number of street lights in the township, and the Hydro Commission will circulate petitions through all streets in the residential area. If sufficiently signed the work will be proceeded with. A request for 300 additional lights was regarded as too large an expenditure to make without the consent of the people.

Buckingham, Que.

A $30,000 water power plant is being built in Buckingham, Que. Engineers are Roy & Toupin, Montreal, and general contractors are Doran Construction Co. Ltd., Ottawa. Work began August 1.

Cranbrook, B. C.

City Electrician Hall, of Cranbrook, B. C., was the victim of a regrettable accident recently which resulted in his being taken to the St. Eugene hospital suffering from a fracture of his right leg. While Mr. Hall was effecting repairs on the city wiring on Fenwick Avenue, the pole on which he had climbed suddenly broke off near the ground. Luckily, he was not wearing his climbing belt at the time. On feeling the pole give under his weight he threw himself away from it thus escaping being crushed under the heavy timber.

Dover Township, Ont.

Residents along the river road in Dover Township, Ont., are now enjoying the advantage of hydro power, which was turned on July 28. This line will be extended to Pain Court as soon as sufficient contracts are secured.

Drummondville, Que.

The new power line erected by the Southern Canada Power Company from Drummondville to Richmond by way of St. Niciphore, L'Avenir, Ulverton, Kirkdale and Melbourne, is practically completed. Over 80 miles of aluminum cable were used.

Estevan, Sask.

Improvements to the local electric light plant of Estevan, Sask., totalling $22,000, are provided for in a by-law submitted to the ratepayers on August 14.

Guelph, Ont.

T. R. Postle, chief operator at the transformer station, Edinboro' Road, Guelph, Ont., was burned during a recent storm when lightning struck the plant.

Jackson's Point, Ont.

On July 21, Hydro power was turned on for the first time in Jackson's Point, Ont.

Kitchener, Ont.

The by-law to purchase the radial line of the Waterloo-Wellington Railway Company, between Kitchener and Bridgeport, will be resubmitted to the ratepayers of Kitchener on August 18 as a result of a decision of the Kitchener City Council recently acting upon a petition signed by 400 ratepayers.

London, Ont.

Plans are being drawn up for the construction of an Ambursen dam at Springbank Park, Ont. In 1921, a cost of $233,400 was estimated for this project. It is stated by Mr. E. V. Buchanan that power possibilities alone do not warrant the dam construction, but that the added capacity would be valuable. Aesthetic reasons are advanced by supporters of the scheme. The Utilities Commission plan to ask council to submit a by-law at the January elections.

McMurray, Alta.

A grant of $55,000 has been made by the Federal Government for the establishment of radio stations at McMurray at the end of the steel in Northern Alberta, Fort Simpson, on the MacKenzie river and Dawson in the Yukon, which will displace the telegraph wires at present in use from McMurray northward and into Dawson. The sum voted for the construction of these radio stations is $55,000.

Mission, B. C.

The Western Canada Power Co. has taken over the plant of the Windebank Electric light and will in future supply Mission with current for light and power. The commissioners have ordered 70 street lights for an area of half a mile square, which will make it one of the best lighted towns in British Columbia.

Montreal, Que.

The Montreal Light, Heat and Power Cons., are erecting a sub-station on Beaumont Street.

The Cid Electric Heater Company has been incorporated, with head office in Monereal. Capitalization is $300,000.

Petitcodiac, N. B.

The N. B. Hydro Commission recently completed survey of the Petitcodiac district. A survey of River Glade was carried on with the Petitcodiac survey.

Hydro would save River Glade the necessity of hauling coal for five miles. The commission extended the service to Hampton Village on July 30.

Port Arthur, Ont.

The two additional units for the Cameron Falls development (described elsewhere in this issue) will be erected around September 1, 1924. T. A. Barrett is superintendent in charge of construction.

Portage la Prairie, Man.

Work on strengthening the Portage la Prairie transmission line of the Manitoba Hydro system, with an expenditure of $35,000, authorized by Hon. W. R. Clubb, minister of public works, will be commenced immediately.

St. John, N. B.

The question of hydro-electric development on the Lepreaux river is being studied by engineers of the New York office of the Federal Light & Traction Company, according to General Manager Pooler of the N. B. Power Company. Mr. Pooler said that the company had not made any recent surveys on the Lepreaux, but that plans and data are available from surveys made several years ago, when detail work was gone into pretty thoroughly.

Quebec, Que.

On July 30 Ralph McDonnough, chief engineer of the former Public Service Corporation, took over his duties as chief engineer of the Quebec Railway.

The contract between the Provincial Government and the Des'Quinze Power Company, of Ontario, for the 60-year lease of the third group of rapids of the Des'Quinze River, has now been signed respectively by Mr. Robert Taschereau, K.C., of Montreal, on behalf of the interested company, and Hon. Honore Mercier, Minister of Lands and Forests, for the Government. The conditions announced at the auction, providing for an annual rent of $80,100, the collection of 50 cents per horse-power exploited, and an additional 50 cents per horse-power exported, were adhered to.

J. B. Challies, director Dominion Water Power Branch, and O. C. Merrill, executive of the Federal Power Commission, Washington, D.C., sailed on July 21 from Quebec to attend a committee meeting in London, England, at which arrangements will be made for the International Water Power Conference to be held in 1924.

St. John, N. B.

Hydro power was turned on in St. John, N. B., for the first time, on July 27.

Timmins, Ont.

Reports state that Hollinger Consolidated Gold Mines are contemplating the purchase of Diesel engines to the extent of 1200 horse power. This would be in addition to their steam capacity of 1500 horse power. It is reported that steam power costs around $200 per horse power in the Porcupine district.

Wilcox, Sask.

The town of Wilcox, Sask., is moving and housing the electric plant. Some improvements will be made.

Windsor, Ont.

Work is to be commenced at once on the $90,000 reconstruction program on Windsor street railway operated by the Hydro-electric Power Commission, Sir Adam Beck announced recently.

More than 200 Hydro employes of the Border Cities, including the Windsor and Walkerville power systems and the Essex division of the Hydro Electric Railways, with their families, journeyed to Sea Cliffe Park, Leamington, on July 26, for their second annual picnic.

Winnipeg, Man.

Mr. James Chicholm has been engaged as consulting engineer for foundation plans of Winnipeg's new hydro stand-by plant.

The city council contemplates installing ornamental street lighting on Kennedy St., Broadway and Portage Ave. The total cost is estimated at $16,500.

Winnipeg city council let the contract for supply and delivery of reinforcing steel for reinforcing of flexible towers on the transmission line of the Hydro-electric system to the Canadian Bridge Co., Ltd., Walkerville, Ont., at $14,200; for the supply and delivery of three 1,500 kv.a. transformers for No. 6 substation of the Hydro-electric system to the Canadian General Electric Co., Ltd., at $9,802; for supply and delivery at city's steam stand-by plant of electrically operated oil switches and switching apparatus: Canadian General Electric Co., six type "H" 203, 15,000 v., 500 amp. circuit breakers at $11,547; Ferguson & Pailin, two 2,400 v., 1,500 amp. and eight 2,400 v., 600 amp. circuit breakers at $6,310.

Resulting from higher operating expenses, taxes and other charges, net earnings of the Winnipeg Electric Railway decreased $16,403 for the first five months of 1923, it was announced recently. The net earnings, totalled $303,769, as compared with $320,172 in 1922. For the same period gross earnings showed an increase of $38,588, total being $2,374,321, as against $2,335,733 for the corresponding period last year.

Woodbridge, Ont.

On August 2 fire caused by lightning forced a temporary shut-down of service of the Woodbridge, Ont., plant. Power from Cooksville was used till repairs were made.

Niagara Falls Factory for Burgess Battery Company

The Burgess Battery Company have opened a Canadian branch at Niagara Falls, Ont., where they will manufacture their line of radio batteries, flashlights, etc. This plant will be under the management of Mr. L. R. Baker, formerly of Burgess Batteries, Limited, Winnipeg.

Wiring Contracts Awarded

Barrie, Ont.

E. L. Pepper, $4,000 house.

Frank Carpenter, house on Bayfield.

Campebllford, Ont.

R. H. Forsythe, high school, $67,375.

East Whitby, Ont.

C. I. Deguerre, Oshawa, Ont., $4,500 house on Park Road.

Hamilton, Ont.

Hunter & Strome, addition to hotel for apartments, $4,500.

Kitchener, Ont.

Knowles Electric Co., $440,000 hospital.

Central Electric Co., $7,000 house on Lydia Street.

Montreal, Que.

Bergeron Electric Works, $4,800 house on 7th Avenue between Dundurand & Masson.

J. A. Amour, $5,000 house, St. Hubert between Bellechasse and Beaubien.

R. Huard, $7,000 house on Drolet between 33rd and 34th Avenues.

H. Lamarr, $7,000 house on Delorimer between St. Jerome and Masson; 3 houses on Addington Ave. between Sherbrooke and Cote Rds., $24,000.

A. M. Hayes, $28,000 house on St. Catherine Rd.

R. Talbot, $6,000 house near 2304 Boyer Street.

J. Langement, 9 flats to cost $30,000; De Gaspe Street.

Mr. Duchesne, garage and alterations to house, $10,000, 156 Nicolet St.

J. W. Tousignant, 17 flats, $50,000, Lafontaine between Sicard and Aird.

J. S. Drummond, 2 houses, $12,000, Cote St. Luc near Claranald.

J. S. Seguin, addition to store $10,000, rear 910 St. Catherine St. E.

Vallee Hamelin, addition and repairs to Ste. Clothilde school, $28,193.

E. Pilin, $16,000 house, Berri between Faillon and Villeray.

A. L. Allard, house and garage, $15,000, Cote St. Antoine Rd.

Jos. Labelle, N.D.G., 2 houses, $16,000, Vendome Ave. near Cote Rd.

Collyer & Brock, alterations to residence, corner Mountrose and Mountain Aves., $12,000.

E. Robillard, residence and garage, Angers St., between Galt and Lecaron, $16,000.

Vincent & Say Electric Co., $200,000 church, Sherbrooke St. W.; $25,000 molasses distillery, 1706 Notre Dame E.; $229,111 school.

A. M. Hayes, $28,000 house, St. Catherine Road.

Oshawa, Ont.

W. A. Bradley, $3,500 house on Mary Street.

Chas. Bowra, $139,733 school, Centre Street.

Oakville, Ont.

B. E. Sprowl, bank and offices, Colborne and George Streets, $40,000.

Sydney Mines, N.S.

E. D. Murphy, Sydney, N.S., school on Main Street, $80,000.

St. Catharines, Ont.

T. Beatty, 5 houses on Niagara Street.

Sault Ste. Marie, Ont.

Taylor Bros., $5,000 store, Korah Road.

Stratford, Ont.

H. Duggan, 3 houses on Bay Street, $9,000.

Sortin, Que.

J. Trofford, $10,000 bunkhouse.

Toronto, Ont.

B. Belmont, 5 stores north side Danforth and Woodycrest Ave., $9,000 each.

Patterson Electric Co., addition to Kew Beach school, $26,000.

B. C. Taylor, 3 pair houses, east side Osler Ave., near St. Clair, $30,000.

David Firth, 5 bungalows, north west corner Ardagh and Durie Street, $6,000 each.

Moss & Stocks Electric Co., $20,000 house, 25 Oriole Gardens; addition to club house, 41 Isabella St.; detached residence, 233 Lytton Blvd.

T. B. Kilner, $8,000 pair houses, east side 8th Ave., near Gerrard E.; $4,000 house, east side 8th Ave., near Gerrard East.

W. J. Crone, $5,500 pair houses, east side 2nd Street; $7,500 pair houses north side Morton Rd., near McMillan Ave.

Walkerville, Ont.

Ford Electric Co., $18,000 house, Nanohoe Street.

Wolfville, N. S.

J. C. Mitchell, remodelling theatre with store front and office, $15,000.

Geo. Clarke on Trip to Australia

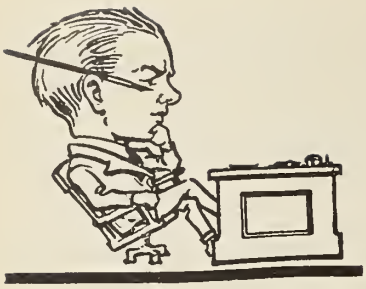
Mr. Geo. Clarke, advertising manager, McClary Manufacturing Company, left on July 25 for a five month's trip to Australia, in the interests of his firm.

Two New Westinghouse Lighting Catalogues

The Westinghouse Electric & Manufacturing Company has issued two new catalogues on electric lighting equipment: Catalogue 8-A on Overhead Street Lighting Equipment and Catalogue 8-B on Ornamental Street Lighting.

The Deltah Electric Company has been incorporated, with head office in Hamilton. Capitalization is $40,000.

Members of the Northern New York Development League inspected the site of the proposed power development at the Long Sault on August 9.



The Editor Comments

Plural Socket Justified

The sharp criticism which is occasionally levelled at the plural plug, or multiple socket, seems to be not altogether justified. Undoubtedly there is some basis for the claim that the use of these plugs cuts down the installation of convenience outlets, and that its use subjects sockets to strains they were never designed for. Against this claim, however, is the strong argument that many people would not be able to use their appliances at all without these plugs. We have in mind the case of the man who lives in a rented house or apartment, which is not equipped with convenience outlets. Unquestionably he wants to use electrical appliances, and it is out of the question for him to have the house wired at his own expense. His appliances are most probably those that lighten the labor of getting breakfast, viz., toaster, percolator, and table stove or grill—and if he is not able to use a plural plug it means unscrewing a bulb and screwing in a connector, in the dim dawn. The plural plug is justified in his case.

And we must remember that this same plural plug is a useful introductory wedge, in the case of people who own their houses, but cannot see their way to have them completely wired. The plural plug shows them just how useful a real convenience outlet would be, and they are eventually converted.

In legal phraseology, however, "nothing in the foregoing is to be construed" as implying that we should ever cease our efforts to have every home properly equipped electrically. The plural plug has its uses, but it is not an ideal arrangement.

What Lies Ahead?

He must indeed be a pessimist who will say that the great inventions have all been made, and there is little scope for original effort in the future.

Various articles which appear in this issue of the Electrical News are a flat contradiction of any such opinion. They chronicle advancements in electrical science that almost dazzle the imagination, if we hark back to where we stood ten years ago. The application of radio, the automatic control of electric plants, and the adoption of automatic equipment in a telephone exchange, are all things that are comparatively new, and they represent distinct advances in each line.

And these are but the beginning. Mr. Hawkins tells us how the development of one branch of electrical science was carried on, and he hints at future developments of as great magnitude. No man can prophesy where we shall stand ten years from to-day, but it can be confidently affirmed that it will be much further ahead.

Plain Talk from Major Burpee

Some good plain talk appears in a letter from Major Burpee, addressed to the employees of the Ottawa Electric Railway, which was recently printed in the O. E. R. Bulletin. The principles enunciated are equally applicable to any other public utility:

"Of the three interested parties, our customers the Public, must be considered first. Unless our service is good enough and cheap enough to attract their patronage we will cease to exist, and both the Employer and the Employees will have to turn their attention to some other line of work. In order to keep the fare at a popular rate, the good service the Public expects and is entitled to must be plain and inexpensive. It also must be convenient, safe and comfortable, and enable them to get from one place to another without undue loss of time.

"Let us look for a moment at the Employee's side. A man who engages as a conductor or motorman cannot expect to earn more than a plain living from it. If he is ambitious and desires a better living than can be obtained from such an occupation he must prepare himself by study and hard work for something that will make his services command a higher rate of pay. The wages he receives for his work as a conductor or motorman should be sufficient however to provide him and his family with a decent living. The conditions which govern his work should be such as not to be injurious to his health and to provide him with a reasonable degree of comfort. If he demands and receives more than this the other two interested parties, his Employer and the Public, must go short. If we go short in giving the Public what they expect, our business will fall away and street railways will eventually be replaced by some more satisfactory means of getting about.

"This brings us to the right of the Employer to a fair return on the invested capital. It is a well known fact in this industry that unless the street

railway, whether it is publicly or privately owned, is financially sound it cannot provide the service the Public expects, and which is necessary to the successful continuation of the business. If the Employer fails to receive a fair return on the invested capital it cannot obtain the funds necessary for extensions or for new equipment as the plant wears out. It must gradually go down hill and, as it does so, the service to the public ceases to be good and its patronage declines."

The fact that there is an unchangeable economic law, that of supply and demand, is one that we sometimes lose sight of. Artificial influences sometimes raise or depress wages or standards of living, but the world eventually works back to a basis laid down by natural law.

Coping with Bargain Sales

A daily paper lies on this desk, and exposes a full page advertisement featuring a sale of electrical appliances (though not by an electrical store.) At the left there is a cut of a floor lamp, which is described as having a "neatly designed, finely finished stand, shade lined and covered in silk and trimmed with fringe." Lamp and shade are priced at $19.75. In the centre are shown fixtures of various designs, all with very low prices attached. The useful electric iron, a favorite of the price cutters, gets another jolt this time when it is offered at $2.95.

The ad. is attractive and no doubt will attract a crowd of buyers—and it hurts the electrical business.

Every dealer comes up against this thing, and it is a problem to meet it. The quality argument, and the service argument are the best ones to use if a customer quotes the cut prices. Bring out your guaranteed appliances and show that they are good value for the money. There is a reason why the sale goods are thrown in the market at bargain prices, and that is because generally, there is something inferior about them. Be enthusiastic about your own guaranteed goods.

Private Interests Seek Power Rights on Ottawa River

A power project which will involve the outlay of over $30,000,000 and perhaps have some effect upon the proposed St. Lawrence River power development has been laid before the Department of Railways and Canals at Ottawa, according to reports. The application plan was placed in the hands of the department by the National Hydro-electric Company, Limited, of Montreal, of which the Robert interests, with whom are associated some American capitalists, are the promotors. The lease first granted to that company in 1911 and revised in November, 1921, to permit of raising the level of the dam at Carillon on the Ottawa River to 94 feet, would again be altered to permit of raising the dam level to 133 feet. This would permit of the development of a large amount of water power, much of which it is proposed to export to the United States.

Put the Lid on

Following the move to put some form of embargo on the export of Canadian pulpwood, our U.S. neighbors are pretending to be very much put out at what they are pleased to suggest would be an unfriendly act. Such an interpretation cannot be considered seriously unless it can be judged unfriendly to lay claim to what is one's own. We are simply minding our own business, and the reason it is causing comment is that we have delayed overlong to do this. Not only should our pulpwood be manufactured into its final product before leaving Canada, but the same should apply to all our raw materials—our timber, our minerals, our wheat, our waterpowers. We are simply playing into the hands of national commercial competitors as long as we fail to do this. If foreign capital prefers to manufacture its own finished products there is no law against its coming into Canada and doing so.

Are we afraid? Must we admit that we have all the essential resources for a great country except "backbone." The decision rests with our Dominion Government to-day.

Ottawa and Hull Power Co. Sold

The recent purchase by the investment banking house of Nesbitt, Thomson & Co., Montreal, of the old established business of the Ottawa and Hull Power Company, Limited, has attracted special interest in financial and public circles.

It is understood that the directorate will be composed of the following: Sir Henry K. Egan, J. B. Fraser, John A. Cameron of W. C. Edwards & Company, and E. R. Bremner of W. C. Edwards & Company, all of Ottawa, and J. B. Woodyatt, vice-president of the Southern Canada Power Company, and A. J. Nesbitt, of Montreal.

The capital of the new company is to be $2,500,000 6 per cent. bonds, $1,500,000 7 per cent. preferred stock, and 25,000 shares of no par value common stock.

The company has water powers with a capacity (including a third unit now being installed) of 40,000 h.p. in its two plants at Chaudiere Falls, and in addition controls a power site at Bryson on the Ottawa River capable of 60,000 h.p. development. Thus the total amount of bonds and preferred stock outstanding (exclusive of the value of the undeveloped power) is $100 per horsepower. The bonded debt is equal to $62.50 per horsepower.

Entirely Automatic Equipment in Winnipeg Exchange

Fort Rouge Office Completely Converted From Manual to Strowger Automatic—6300 Single Party Lines—Cut Over Made Without a Hitch

Another step in the plan of converting the Winnipeg, Canada, manual telephone exchange to Strowger Automatic, was completed when the Strowger equipment which was installed in the Fort Rouge Office was cut into service on January 21st, 1923. With this cutover of 6,590 automatic lines, approximately 28,000 of the 43,000 lines in operation in Winnipeg are now on an automatic basis.

The new automatic equipment, which is located in the same building as previously housed the Fort Rouge manual equipment, was terminated at the main distributing frame on a group of protectors separate from that to which the lines from the manual switchboard were wired. The cutover therefore involved first, the removal of the heat coils from the protectors which terminated the manual lines, and then the removal of the toothpicks which had been placed in the automatic line switches to make them inoperative during the installation period.

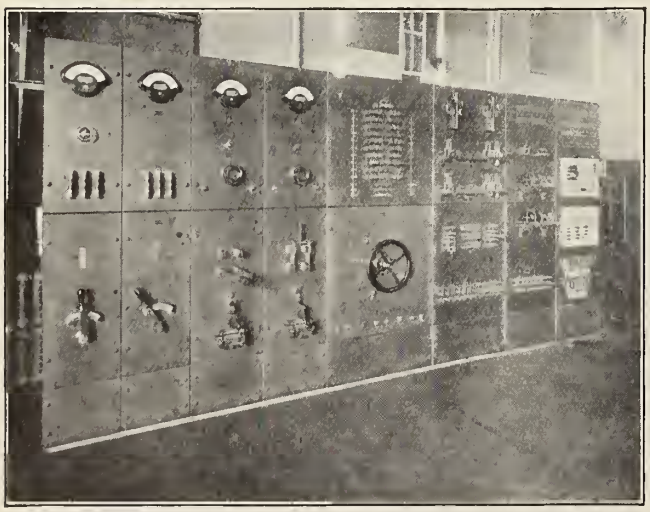


Bank of Montreal, Private Automatic Exchange

At 12:07 A. M. on January 22nd., J. E. Lowry, Commissioner of the Manitoba Telephone System, gave the signal for the operation of removing the heat coils from the manual line protectors to commence, and nine minutes thereafter the last of the 12,000 heat coils had been removed. The operation of removing the 6,570 toothpicks then followed and was completed in ten minutes, the first toothpick being removed by Hon. F. M. Black, Minister of Telephones, from line F-1051. Thus nineteen minutes after the signal had been given, the cutover was completed, and the calls commenced to go through on an automatic basis.

The equipment, which was manufactured by the Northern Electric Company, Limited, at Montreal, and has the distinction of being the first Canadian Made Strowger Automatic equipment to be placed into service, serves a combined business and residential area.

The initial equipment is composed of 67 primary line switch units serving 6,300 single party flat rate lines, 50 two party flat rate lines, 50 P. B. X. flat rate lines, 170 pay station and message rate lines and 20 rural lines, 5 secondary line switch units; 12 trunk boards on which are mounted the various local and toll selector equipment, the rural switches, and



Power Switchboard, Fort Rouge Office, Winnipeg, Man.



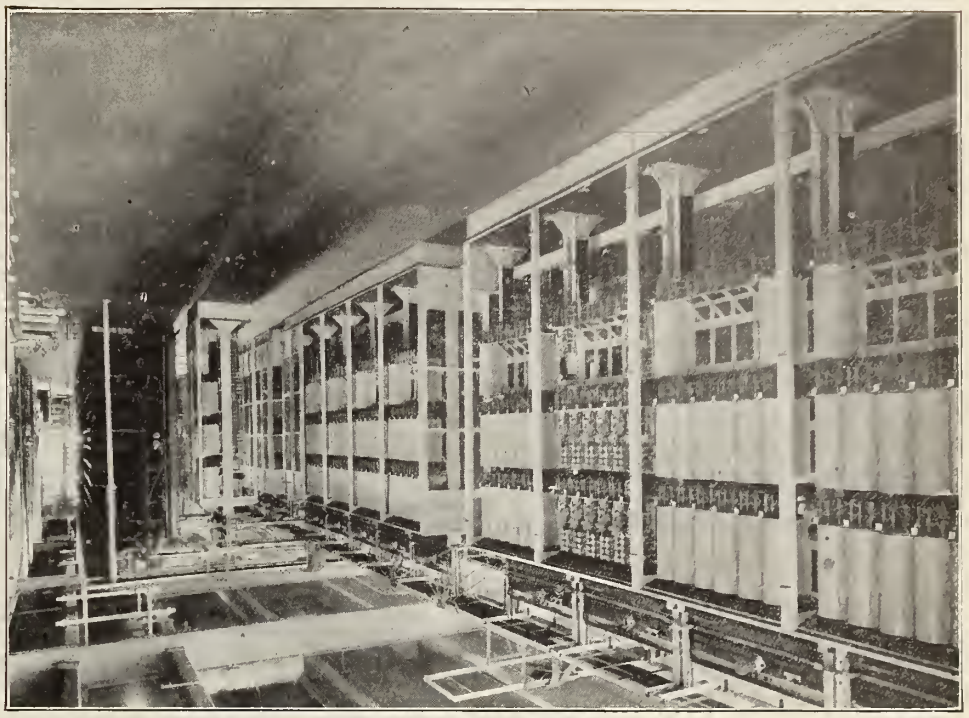
Battery Room, Fort Rouge Office, Winnipeg, Man.

impulse and trunk repeaters.

The following statement, which appeared in the Manitoba Telephone System's publication "Telephone Echoes" testifies to the satisfactory performance of the new automatic equipment.

"Although the hour was late, quite a number of calls commenced going to and from different points of the city. The switches accepted and transmitted the numbers in first class order as though they had been in operation months instead of minutes."

The contract for the apparatus was signed only slightly more than a year ago. At that time the Northern Electric Company had not finished making the necessary tools for the production of the equipment. This is a very enviable record for a project of this kind, as the installation necessitated equipment for many special services, such as Private Branch Exchanges ,Automatic Pay Stations, Automatic Rural Lines, Toll Lines, etc.



Fort Rouge Office Switchroom

The automatic equipment will complete the connections which were formerly established by approximately 90 girls and without any additional male help being required for maintenance purposes, thus effecting a saving in wages which will amount to approximately $80,000 per year.

The conversion of the Fort Rouge office is in line with the plans of the Manitoba Government Telephone Administration to change the telephone system of Winnipeg completely to automatic working as soon as it is economically possible, the system to be converted office by office as convenience dictates.

During the conversion period the interchange of calls between manual and automatic stations is cared for by equipping each manual "A" position with a dial and a set of dial keys and by terminating the automatic to manual trunks at "B" positions in the manual offices. In this way, the automatic equipment eliminates all local operators from the converted offices.

Coincident with the cutover of the Fort Rouge equipment, there were also placed into service for the Manitoba Telephone System two 100 line private branch automatic exchanges, each with an initial equipment for 60 lines. One of these was installed for the use of the Winnipeg Free Press and the other for the Winnipeg Branch of the Bank of Montreal. These two installations bring the total of P-A-X equipment in operation in Winnipeg up to six. In addition to these, a 300 line P-A-X equipment will be installed in the near future in the Winnipeg Office of the Canadian Pacific Railway Company. These installations provide further evidence of the Manitoba Telephone System's progressive policy which calls for a rapid automatic equipment expansion.

Contracts for Cameron Falls Units

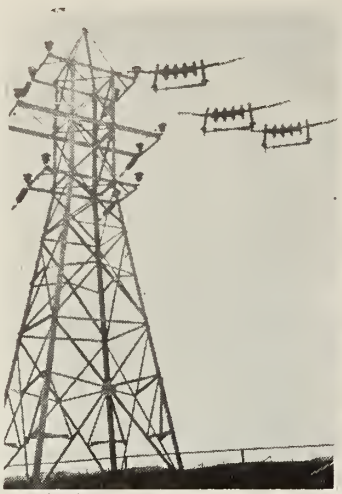
The Hydro-electric Power Commission of Ontario have awarded contracts for two more complete units to be installed at Cameron Falls, Nipigon River, in the vicinity of Port Arthur and Fort William. The two new turbines will be supplied by the Canadian Allis-Chalmers Limited, and the electrical equipment by the Canadian General Electric Company. This will include two 10,600 kv.a. generators, three 8,000 kv.a. and three 4,800 kv.a. transformers, the latter for installation at the Port Arthur end of the line.

English Manufacturers at Canadian National

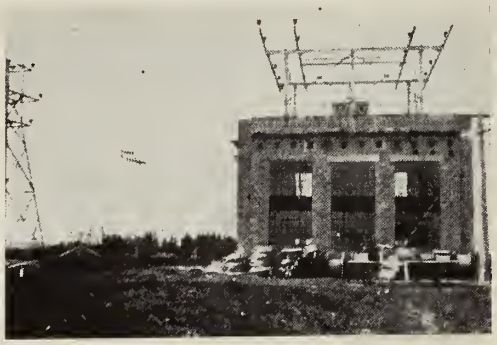
The Federation of British Industries, London, Eng., which corresponds to the Canadian Manufacturers Association in Canada, have made arrangements for fifty-four United Kingdom manufacturers to exhibit in the International Building at the Canadian National Exhibition this year.

St. Anne Power Company

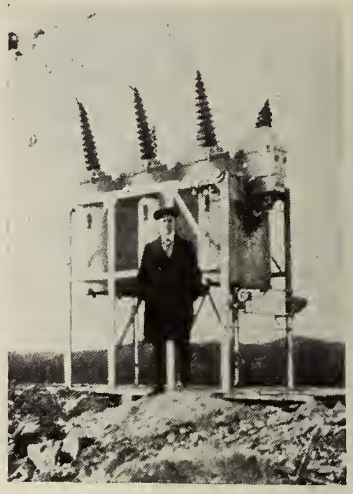
At the annual meeting of the Board of Directors of the St. Anne Power Co., Beaupre, P.Q., held July 30th, the following officers were elected for the ensuing year: President, S. C. Bayless; vice-pres., A. W. Cooper; treasurer, F. J. Bayless; secretary, C. E. Taschereau.



Main feeder tower for the Fairville sub-station, 66,000 volts



Sub-station at Fairville fed by 66,000 volt current from the Hydro-electric development at Musquash



66,000 volt oil circuit breaker on Moncton line

Power Line Construction in New Brunswick

Musquash Development Makes Available Hydro Power on Large Scale —Power Line Construction Work by Stephen Construction Co.

By the time this appears in print St. John, N.B., will be using power from the Musquash development. This consummation has been delayed by the recent spring floods, but part of the civic distribution system has been completed, and current from that section is available.

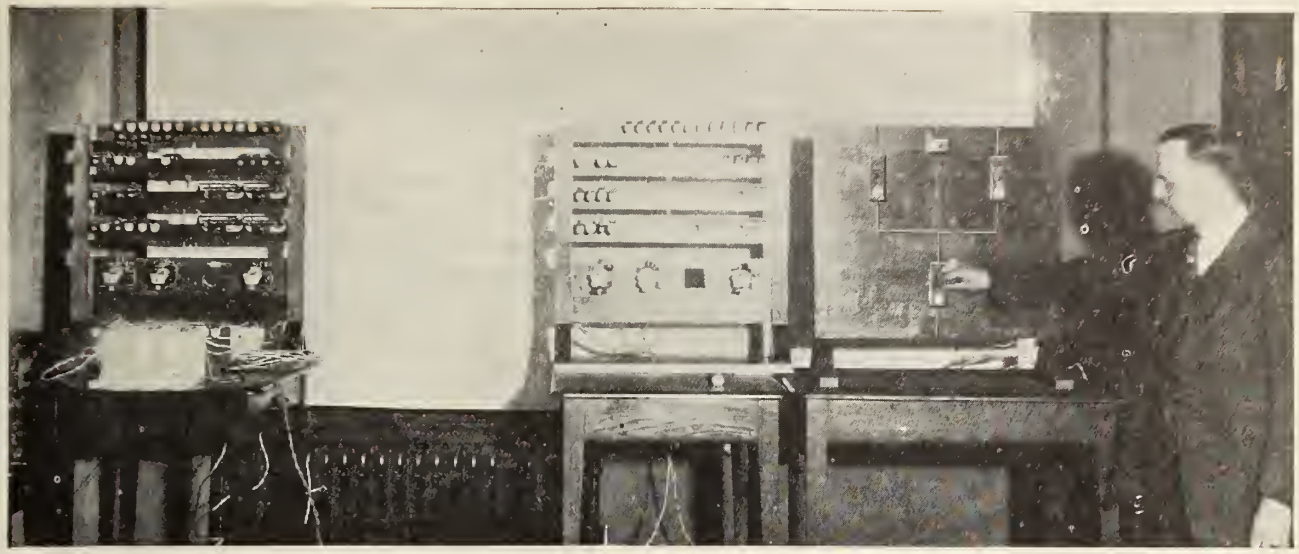
Construction work has been carried out by the Stephen Construction Company of St. John. They are placing all the poles except the fancy standards and are stringing wires for the lighting system. This work is being done under the direction of the provincial hydro commission. Mr. Willet, secretary for the St. John Power Company, states that the work will be completed as soon as possible. It will not be necessary to finish any great part of the system, the idea being to start serving consumers as soon as meters are installed. Power will be sold at a 4 cent rate.

The accompanying illustrations show the various phases of the construction work which it is necessary to undertake for the distribution of Musquash power. Fig. No. 1 shows substation at Fairville, N.B. This steps a transmission voltage of 66,000 down for local use. Another part of the installation at Fairville is shown in Fig. 2. This represents the main feeder, showing the main aerial switch on the 66,000 volt system. The Fairville sub-station steps the power down to 2300 volts at which voltage it is distributed up along the St. John as far as Wellsford, N.B.

Fig. No. 3 shows a 66,000 volt oil circuit breaker. This relates to the installation which has been supplying current since early this year, viz., that line which supplies power up along the Kennabecasis River as far as the city of Moncton.

For these photographs we are indebted to Mr. C. W. Griffiths, contractor-dealer, of St. John, N.B. Mr. Griffiths is very enthusiastic about the recent development and states that a plentitude of electric energy is bound to stimulate sales of electrical appliances and generally help the electrical business along.

Citizens of St. John are very much interested in the progress that is being made towards the installation of the lighting system. The new system calls for three times as many standards with three times the capacity of that heretofore in use. W. I. Snook has special contract for the erection of the aerial street lighting system.



Automatic Electric Control has Human Aspect

Wonderful Capability of Automatic Supervisory Control for Sub-stations and Generating Plants—Two Methods for Large and Small Systems

By J. L. McCOY*

The automatic supervisory control of sub-stations and hydro-electric generating plants presents to the electrical world a new development of a quasi-human aspect.

There are two methods of automatic supervisory control of sub-stations: one of these methods, which is called the "Key Control and Lamp Supervision System," is capable of controling as many as seventy circuit breakers and is applicable to very elaborate and extensive power systems. The other is the "Dial Control and Audible Signal" for use in smaller power plants.

When one of the keys on the control board of a power station is thrown, the corresponding circuit breaker in the distant sub-station is operated and a signal transmitted back to the operator by the lighting of a small red lamp above the key to show that the desired breaker has operated.

A Complete Control System

A complete control system consists of one manual sending circuit, which is controlled at will by the load dispatcher by the operation of small two-way telephone keys, each key representing one circuit breaker. When the key is thrown in one direction it sends a code of successive impulses which operate the proper selector and close the corresponding circuit breaker. When thrown in the opposite direction it sends a different code to open the same circuit breaker. A large number of these keys can be numbered and mounted in a small cabinet or table. The dispatcher may throw one key at a time, or he may throw as many as he desires. The sending apparatus will select each key that is thrown and send its respective code over the line in proper sequence without interference. Should any key be thrown accidentally and then be restored to its neutral position before having sent a complete code, the sending and receiving circuits will restore themselves to their normal positions without causing any undesirable operation. Should several circuit breakers open simultaneously, there will be no confusion in the sending of the codes representing the different positions, because the automatic sender will pick out each operation, one after the other, and send them all through without any interference.

Dial Control

The operation of the other system of remote control, called the "Dial Control, Audible Supervisory System," is not adapted to either the same or so extensive a power system as the one just described. It is, however, well suited to the operation of hydro-electric generating plants in localities requiring a small but reliable source of power and may be applied with equal success to the control of small sub-stations. The dispatching system is equipped with a small box

*Switchboard Engineering Department, Westinghouse Electric and Manufacturing Co.

called a dispatcher's cabinet, containing one or more small telephone keys and an automatic telephone dial of the usual type. If the dispatcher is located at the end of the line to the different stations only one station is necessary. If he is situated in the center of radiating lines, having several generating stations or sub-stations on each line, as many telephone keys are provided as there are pairs of radiating telephone lines going out of the dispatcher's office. By means of these keys the telephone dial is switched to any line selected.

The operation of the telephone dial is so familiar to those who live in cities served by the ever-widening automatic service that its operation needs no description. Suppose, however, that the operator desires to ascertain the water head at station number five on line three. He will close the key on line three and with the telephone receiver to his ear will turn the dial to figure five. Immediately after the dial operation has been completed he will hear five taps of a bell, indicating that he is connected to the desired station. He will then dial the number assigned to water head indication and will hear a series of tone pulses in his receiver, which will indicate the water head.

One of the greatest advantages in the use of either type of apparatus is that the system is put under the control of one man.

As this apparatus is quite rapid in operation, the power system can be dispatched in a much shorter time than if all orders have to be relayed verbally to the operators.

Pacific Coast Personals

A. T. Goward

Mr. A. T. Goward is vice-president, B. C. Electric Railway Co. He was born in Tenby, South Wales, and educated there.



A. T. Goward

Coming to Canada shortly after completing his education, he entered the service of the B.C.E.R. Company in 1890, then known as the National Electric Tramway and Lighting Company.

Mr. Goward was made manager of the Vancouver Island branch in 1897, and vice-president, with jurisdiction over all the company's affairs on Vancouver Island, in 1923.

He is a member of the Victoria Chamber of Commerce, the Union Club of Victoria, and is an enthusiastic and prominent member of the Victoria and Colwood Golf Clubs.

S. J. Halls

S. J. Halls was born and educated in England and received his first business experience in shipping circles in Leadenhall Street, London. He joined the staff of the B. C. Electric in Vancouver 23 years ago and shortly afterwards proceeded to South Africa with the Canadian Mounted Rifles, seeing service in the Boer War.

In 1902 he rejoined the company. He was later



S. J. Halls

transferred to Victoria on receiving his present appointment, early in 1909.

Mr. Halls holds several offices. He is president, Victoria Electrical Association, member of executive, B. C. Council, St. Johns Ambulance Assn., member Canadian Electrical Assn., N.E.L.A., Victoria Chamber of Commerce and various other organizations. Mr. Halls' present position is manager Light and Power Department, B. C. Electric Railway Company, Victoria, B. C.

Contracts Awarded for Equipment of Hollinger Plant

The Hollinger Consolidated Gold Mines have awarded contracts for the equipment at Portage Rapids, Abitibi River: the turbines will be supplied by the Dominion Engineering Works, Montreal, and the generators by the Canadian General Electric Company. These latter consist of two 12,000 kv.a., 25 cycle, 125 r.p.m. units.



The Magic of the Tube

L. A. Hawkins Tells C.E.A. Convention of the Wonderful Work That Has Made Radio Broadcasting Possible—A History of the Work That Has Led up to this Culmination —What of the Future

By L. A. HAWKINS*

Today I think it is safe to say we know more about electricity, know more truly what it is, than of anything else in the universe. This wonderful extension of knowledge is due to Sir Joseph Thomson, who discovered the electron, the unit of electricity; he measured it and weighed it and told us all its properties, and showed how matter itself was composed of electrons. Since then, physical and chemical research has aimed at explaining all other phenomena, even the phenomena of life, in terms of that simplest and most fundamental of things, the electron.

Now it is in vacuum tubes that the electron can most freely display its properties, undisturbed by atoms and molecules. It was the discovery of the electron that made possible the research that led to the modern vacuum tube. So when Sir Joseph Thomson visited us last spring and saw in our vacuum tube factory the various types and sizes of tubes in quantity production, the newest and most powerful Coolidge X-ray tubes, and the high power tubes now used for radio transmission, and when he saw in our laboratory still more powerful tubes designed for power work, he was seeing the present state of a new and great development whch had its origin in his own scientific discoveries.

The Story of Vacuum Tube Development

This development did not spring directly from Thomson's discovery. Years of research on high vacuum, its production and measurement, and on electron emission from hot filaments, were necessary before the engineering development could start. But that research, though conducted in an industrial laboratory, differed not in kind from Thomson's, and in a sense was a continuation of it.

The story of this vacuum tube development is interesting as showing how one research after another by different workers laid the foundation for successive engineering developments, each more important than the preceding, and even now promising still greater things to come.

Edison, in the course of his engineering development of the incandescent lamp noticed occasionally an effect which has ever since been known by his name. He observed in certain lamps a blue glow which resulted in a rapid chewing away of the ends or one end of the filament. He also found that the effect never appeared in lamps that were specially well exhausted. He found that the blue glow was caused by the passage of current between the ends of the hot filament. He inserted a plate and passed current between the filament and plate. But when the vacuum was made too good the current stopped. That was as far as the state of knowledge of the action of an electric current permitted one then to go.

Advent of Low Vacuum Tube

Then when radio telegraphy had been discovered, Fleming saw the possibility of using as a detector Edison's combination of hot filament and plate, and gave us the so-called Fleming Valve. This was an engineering application of Edison's research. Next De Forrest discovered that the current in the Fleming valve could be controlled by the introduction of a third element called the grid. That discovery gave birth to a new and important engineering development, the De Forrest audion. Still these tubes remained as low vacuum devices. They became inoperative if the exhaust was carried too far. They could be operated only at low current and low voltage, for around thirty volts the blue glow that Edison had first observed would set in, the action would become erratic, and the tube would soon be destroyed. They were very useful for reception of radio telegraphy, but that was all.

But meanwhile J. J. Thomson had made his great discovery of the electron, and showed the part it played in the flow of current through gases. It then became evident that the Edison effect was the result of electrons emitted from a hot filament, and renewed interest was aroused. Still for a time the research workers could obtain no current when the vacuum was too good, and the conclusion was generally though reluctantly accepted that the electron emission was dependent on some reaction, not understood, between the residual gas and the hot filament.

*Extract of paper before C.E.A. Convention, Montreal.

It is true that Richardson, working with a sensitive galvanometer, found he could get measurable electron currents, micro-amperes, in a really high vacuum. He established an equation giving the relation between current voltage, and filament temperature. But according to that equation the electron current obtainable from an ordinary lamp filament should be amperes, while other experimenters had obtained nothing large enough to measure.

Richardson's Experiment

This was the state of things when Langmuir of our laboratory began his investigation, to find out why the Richardson equation did not hold for higher currents. His research resulted in the discovery of the "space-charge law." He found that electrons were emitted from the filament in accordance with Richardson's equation, but that in high vacuum these emitted electrons in the space immediately surrounding the filament, being as J. J. Thomson had shown, particles of negative electricity, charged that space negatively and prevented additional electrons from leaving the filament. With the minute currents Richardson had used, the space charge was not effective, but with the attempt to draw larger currents in high vacuum it became the dominating thing. With poor vacuum the space charge was neutralized by the positive ions generated in the residual gas by collision with the electrons.

Langmuir's Work

Thus Langmuir's work cleared up the apparent conflict between previous experiments and comprehensively explained all the phenomena. He went on to show that even in a high vacuum large currents could be obtained by quickly removing the electrons from the space around the filament, that is, by bringing the anode close to the filament and using a high voltage. Thus at once the hot filament vacuum tube was transformed from a low voltage, low power device, to a high voltage, high power device. Instead of milli-watts it could now handle watts and even kilowatts. For the first time we had a device capable of taking the output of a telephone microphone and amplifying it to any amount for radiation from an antenna. In other words radio telephony was born. Radio broadcasting became possible.

The Revolutionary Coolidge Tube

Meanwhile Coolidge had taken Langmuir's discovery and applied it to the X-ray art. The Coolidge X-ray tube, with its high vacuum, and with its output always under exact control, has revolutionized X-ray technique and has made possible new engineering developments greatly extending the field of usefulness of X-rays.

But these two developments, radio telephony and broadcasting and the revolutionizing of the X-ray art, important as they are, are probably not all the results to be expected from Langmuir's study of the Edison effect. We believe that vacuum tubes will find their place in the power field. With vacuum tubes alternating current may be changed to direct current, direct current to alternating current, alternating current to alternating current of another frequency, or direct current to direct current of another voltage. Already we have built a tube of 1,000 kw. output at 25,000 volts. Such a tube is about the size of a golf bag. Certainly that does not represent the limit. We have operated X-ray tubes at 250,000 volts, 50 milliamperes. There seems no insuperable difficulty in building a power tube for such a voltage. That would multiply our output by 10, giving us 10,000 kw. Much research and years of development will be needed before vacuum tubes can compete with rotary apparatus at ordinary voltages and frequencies ,but it is entirely possible that in the super-power transmission of the future vacuum tubes will be used.

Rescue and Resuscitation

This illustration shows three views of the interesting entertainment put on by Wills Maclachlan and his life saving crew during the visit of the A.M.E.U. delegates to the plant of the Orillia Commission on the Severn River, during the recent convention



at Orchard Point Inn. On the left, the unconscious man is being lowered to the ground with rope and tackle; in the centre, resuscitation is being carried out; on the right, he is being carried off on a stretcher after recovering consciousness.

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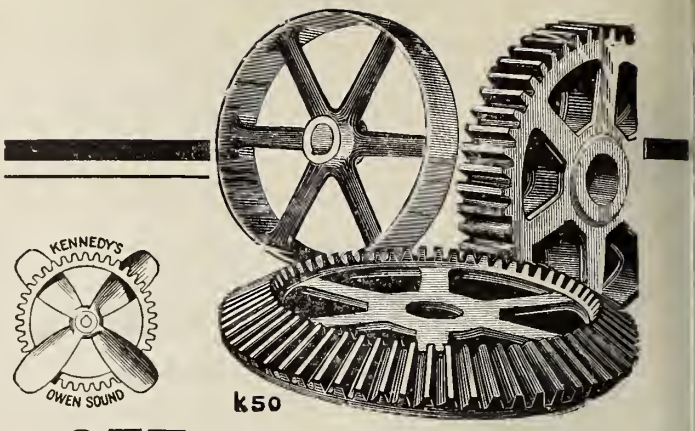
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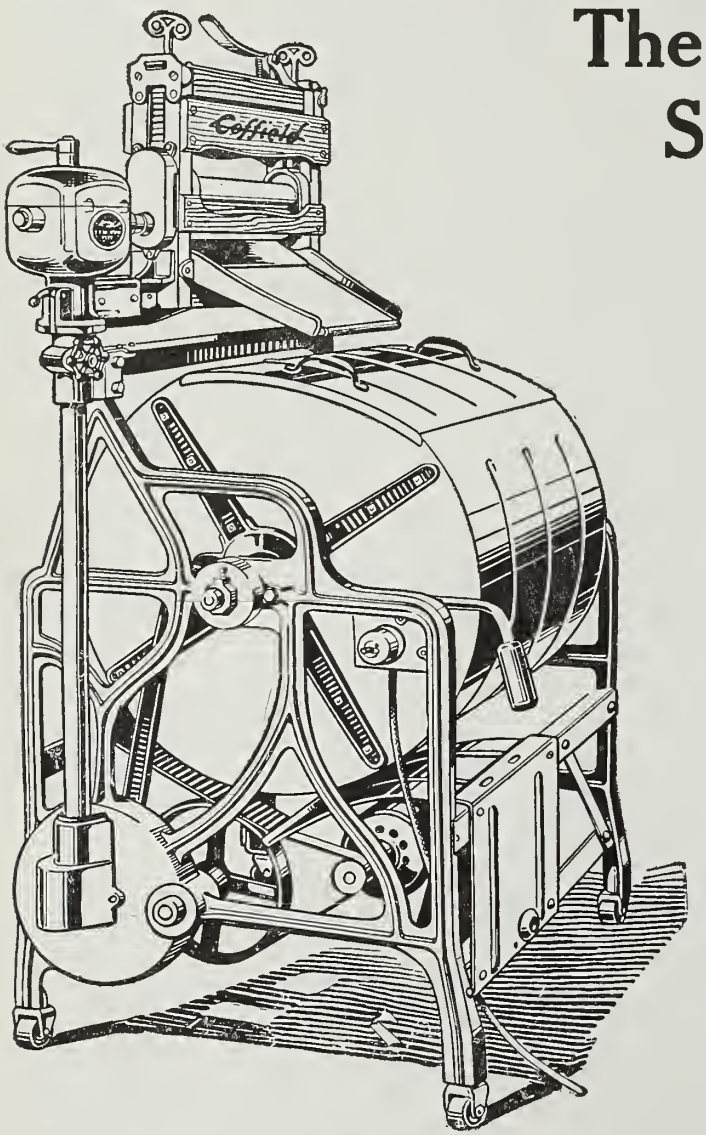
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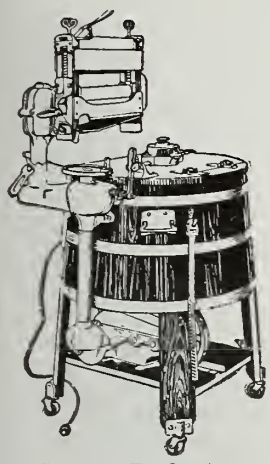
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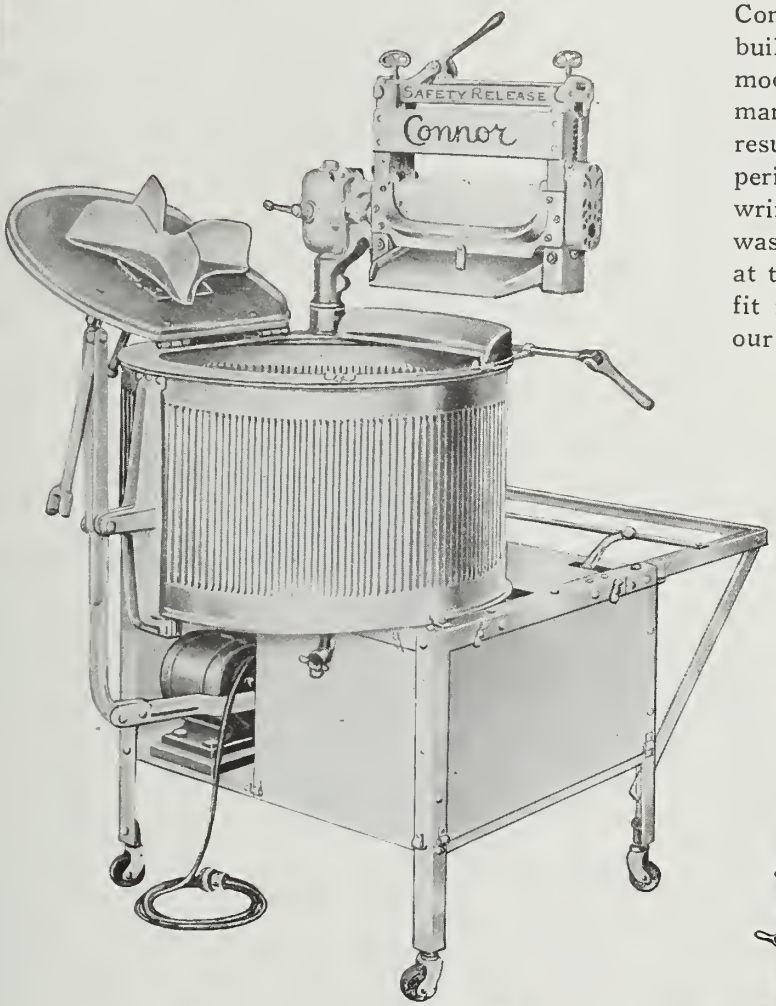
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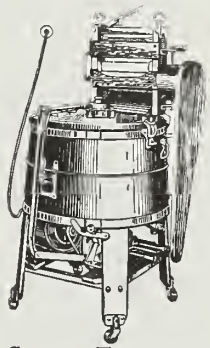
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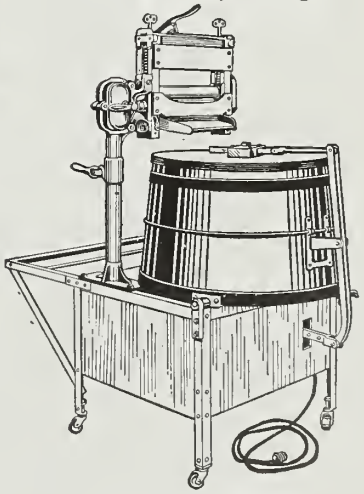
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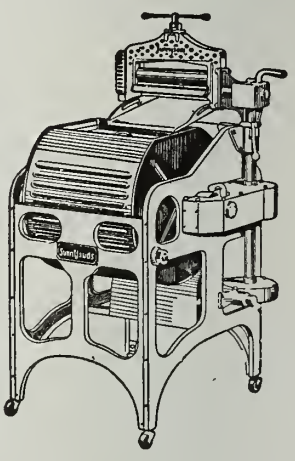
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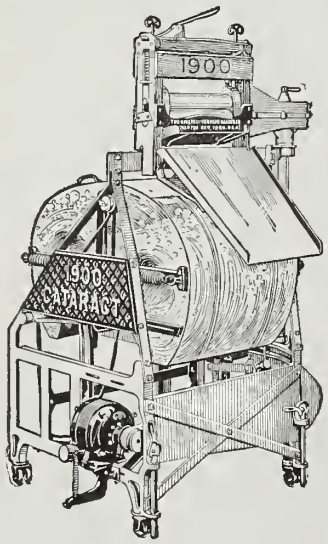
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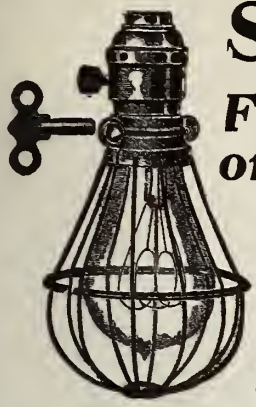
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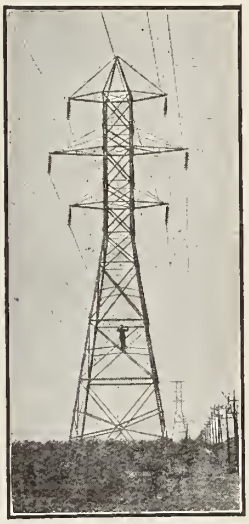
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FIBRE (Vulcanized)
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Slater, N.

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Rawlplug Co., of Canada

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Canadian National Carbon Company
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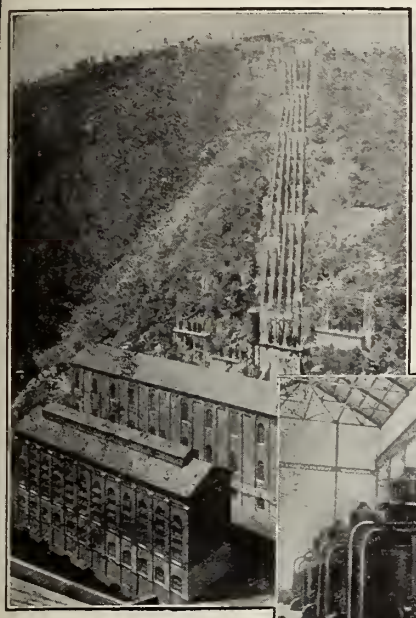
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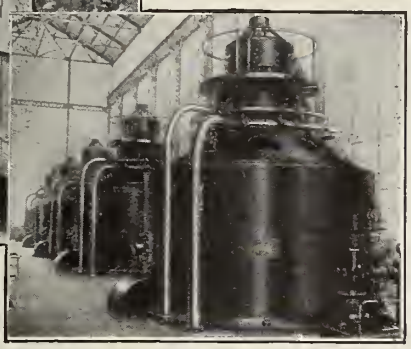
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1	2	1800	Westinghouse
3	5	1800	Westinghouse
1	5	1800	T.H.E.
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1	2	1800	C.G.E.
1	2	600	C.G.E.
1	2	1800	Chapman Walker
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1	8	1800	T.H.E.
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6	30	750	Crocker Wheeler " " "
1	15	1450	Westinghouse (new) " " "
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Mica Insulator Co.

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Kent Brothers
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Mica Insulator Co.

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Electrical Maintenance & Repairs Company
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"A Laboratory Manual of Alternating Currents" by John H. Morecroft, E. C. Published in 1912 by Renouf Publishing Company. 248 pages, illustrated. Price $1.00.

"Baudot Printing Telegraph System," by H. W. Pendry. Published in 1913 by Whittaker & Company. 144 pages, illustrated. Price $1.50.

"Direct-Acting Steam Pumps" by Frank F. Nickel. Published in 1915 by McGraw-Hill Book Company. 258 pages illustrated. Price $2.00.

"Electric Railway" by A Morris Buck, M.E. Published in 1915 by McGraw-Hill Book Company, Inc. 390 pages, illustrated. Price $2.50.

"Engineering Electricity" by Ralph G. Hudson, S.B., 190 pages Illustrated. Published in 1920 by the John Wiley & Sons, Incorporated. Price $2.00.

"Handbook of Machine Shop Electricity" by C. E. Clewell. Published in 1916 by McGraw-Hill Book Company. 461 pages, illustrated. Price $2.50.

"Principles of Alternating Current Machinery" by Ralph R. Lawrence. Published in 1916 by McGraw-Hill Book Company. 614 pages, illustrated. Price $3.50.

"Radiodynamics"—The Wireless Control of Torpedoes and Other Mechanisms, by B. F. Miessner. Published in 1916 by D Van Nostrand Company. 206 pages, 112 illustrations. Price. $1.50.

"Telegraph Practice, a Study of Comparative Method" by John Lee, M.A. Pubished in 1917 by Longmans-Greene & Co. 102 pages. Price 75c.

"Telegraphy"—A Detailed Exposition of the Telegraph System of the British Post Office, by T. E. Herbert, A.M. Inst., E.E. Third edition. Published in 1916 by Whittaker & Company. 985 pages, 630 illustrations. Price $1.50.

"Theory and Calculation of Transient Electric Phenomena and Oscillations," by Charles Proteus Steinmetz. Third edition, revised and enlarged. Published in 1920 by McGraw-Hill Book Co., Incorporated. 696 pages, illustrated. Price $6.00.

"Testing of Electrical Machinery," for non-electrical students, by J. H. Morecroft. Fourth edition, revised and enlarged. Published by D. Van Nostrand Company, 1921. 220 pages, 111 illustrations. Price $3.00.

"The Dynamo" (2 volume), by Hawkins & Wallis. Published in 1909 by Whittaker & Company. Price $3.00.

"The Essentials of Transformer Practice". A treatment of the theory, design and operation of the transformer from a practical engineering viewpoint, prepared primarily for the engineering student and the designing and operating engineer, by Emerson G. Reed. Just published by D. Van Nostrand Company, 265 pages, illustrated. Price $3.00.

"The Practical Railway Spiral" by L. C. Jordan, C.E. Published in 1913 by Van Nostrand Company. 155 pages. Price 50c.

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This Space is Available

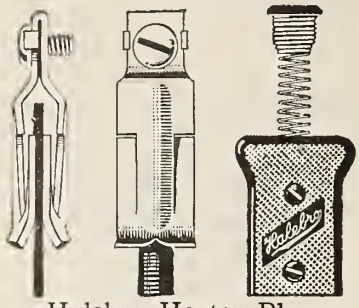
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This two color attractive space is available from our issue of September 1st onwards at a cost of only $60.00 per inch, per year of 24 issues reaching 3,500 electrical men throughout Canada. The above firms whose cards are shown find this small space especially valuable and many of them have been with us for years.

Write to-day!

Electrical News
349 Adelaide Street West, Toronto

Improved Halebro Heater Plug



Halebro Heater Plug

These clips are made of selected spring brass, designed to fit perfectly on either round or flat terminals, THEY WILL NOT ARC.

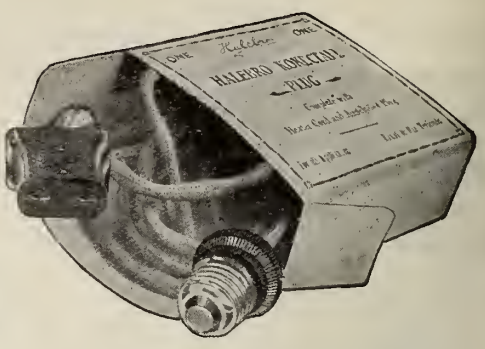
This feature assures long life and satisfaction.

Hydro Electric approval No. 403.

Order from your jobber

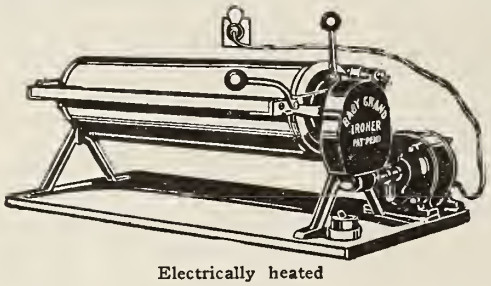
Manufactured by

Hale Bros. 435 St. Paul West
Montreal



Halebro Renewal Cord Complete

Small but Sells Big



Electrically heated

BABY GRAND IRONER

"A Household Necessity"

The steady increase in "Baby Grand" sales points to the nice profits which dealers are making. This market has scarcely been touched and now is the time to start getting YOUR share. A card will bring particulars.

INGERSOLL MACHINE & TOOL CO. LIMITED
Ingersoll, Canada

Toronto Office—230 Bay Street
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Wire us, if you need any of these in a hurry

I-T-E Circuit Breakers and U-Re-Lites.
Cutter Elec. & Mfg. Co., Philadelphia.

Hi-Tension Air Break Switching and S & C Fuses.
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AMERICAN INSULATOR CORPORATION
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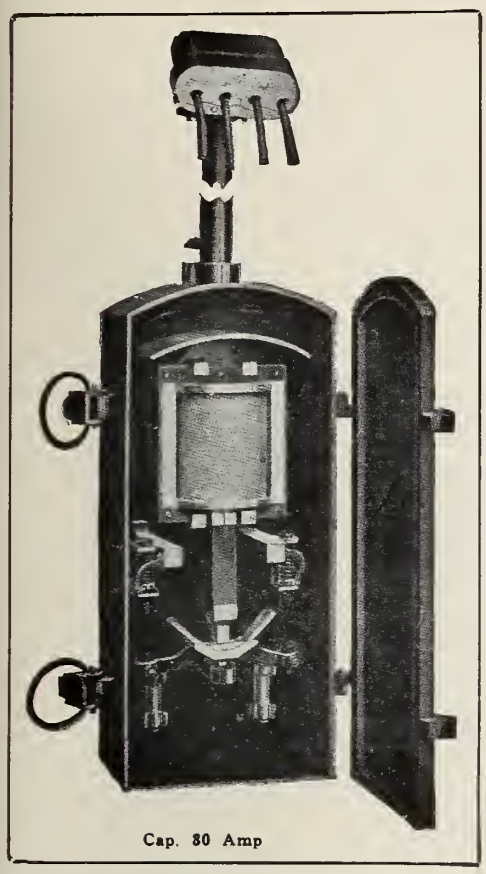
Double the Life of Your Pole Lines

By using our
OPEN TANK TREATED

British Columbia Cedar Poles

They afford your pole lines better support, and add considerably to their appearance. Let us send you further particulars and prices No obligation.

Lindsley Brothers Canadian Co., Ltd., Nelson, B. C.
Filer-Smith Machinery Company, Limited,
708 Confederation Life Building, Winnipeg, Man.
Irving Smith, M.L.C. Building, Cor. Craig and St. Alexander Sts. Montreal, Que.



Cap. 30 Amp

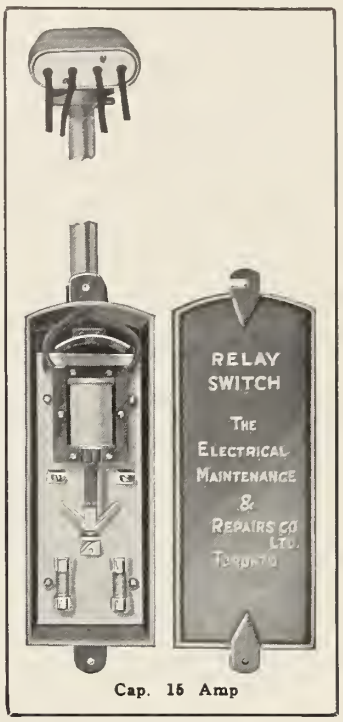
Engineers, Take Notice!

A new, smaller, simplified Remote Control Switch.

A young friend of our 30 Amp Switch—to do the many small jobs where the big fellow is too expensive.

Cheaper, yet perfectly dependable. Has been tested equal to five years' service.

For Street Lighting Control. Write about this.



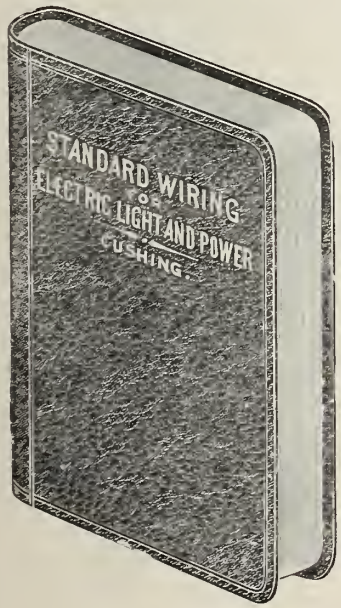
Cap. 15 Amp

The Electrical Maintenance & Repairs Company, Limited

162 Adelaide Street West Toronto

The Acknowledged Authority on Electric Light and Power Wiring and Construction

The above is the opinion of a prominent official of the Hydro Commission



Size 4½ x 6½

"Standard Wiring"

ENDORSED BY THE WIRING DEPARTMENT OF THE JOINT COMMITTEE FOR BUSINESS DEVELOPMENT IN THE MOVEMENT TO "ELECTRIFY."

This latest edition contains over twice the amount of useful information ever before published. The National Electrical Code explained and illustrated. New illustrated chapters on Outside Wiring and Inside Wiring for all systems for both direct and alternating currents; House and Residence Wiring, Garage Wiring, Theatre and Moving Picture House Wiring, Marine Wiring, Electric Sign Wiring.

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Consisting of 144 Pages with 300 Cuts Describing 60 Different Lines.

This catalogue illustrates complete lines of

Low and High Tension Switches
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Switchboards
Steel Boxes

and materials used daily; also several pages of Handy Tables.

Have you received your copy? if not, write today

THE DEVOE ELECTRIC SWITCH COMPANY

MONTREAL TORONTO

Vol. XXXII No. 17

Toronto, September 1, 1923

Electrical News



EDISON MAZDA BLUE BOOK

Containing A Complete Advance Outline of this Season's Edison Mazda Lamp Advertising

See Pages 12-13

A Wire for every Electrical need



Copper Line Wire
Copper Tie Wire
Trolley Wire
Brass and Bronze Wire
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Automobile Wire
Car Wire
Magnet Wire
Telephone Wire
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Northern Electric Company
LIMITED

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"Makers of the Nation's Telephones"

MANUFACTURING
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Automatic Telephones
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Fire Alarm Systems
Radio Sending and receiving Equipment

DISTRIBUTING
Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

Removing the Menace of Darkness



INEFFICIENT Lighting in the factory is not alone non-productive of good work, but it is a positive danger. Many thousands of avoidable accidents occur every year in factories and workshops directly due to inefficient lighting. A sure remedy whereby this condition can be permanently removed is by the installation of correctly designed reflectors.

BENJAMIN
Industrial Lighting

Correct lighting means lower cost through greater production, fewer accidents and less spoilage. On request we will mail you informing literature on the various types of Benjamin Reflectors — Dome R.L.M. — Deep Bowl — Shallow Bowl — Flat Cone and Elliptical Angle Reflectors.

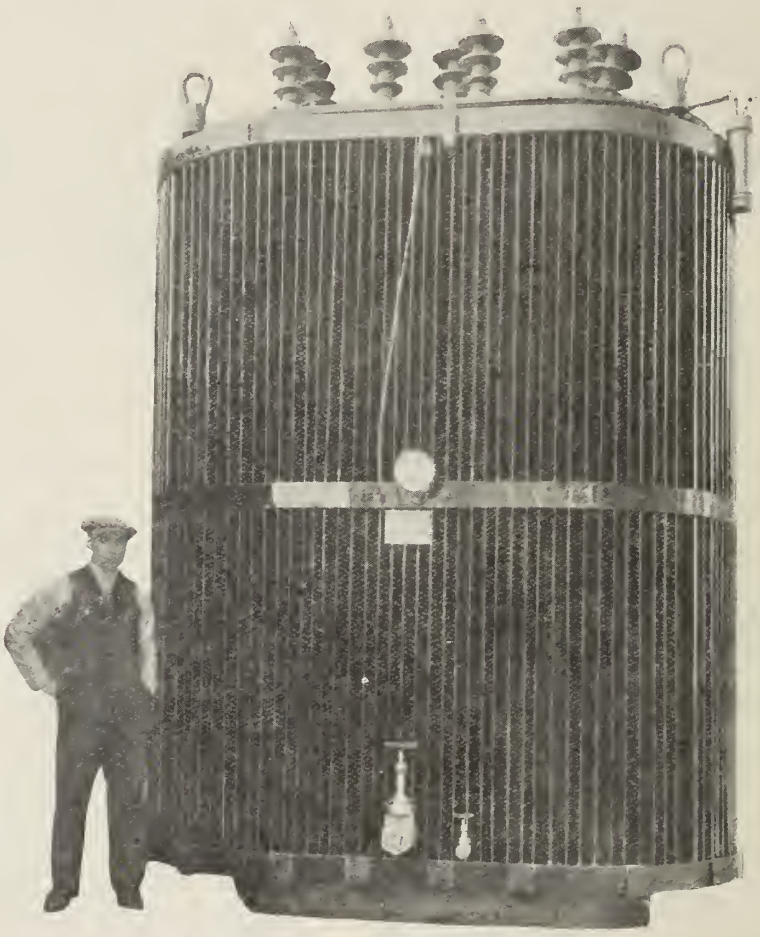
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Benjamin Electric Mfg. Co.
of Canada, Limited
TORONTO
Montreal *Winnipeg*

Packard Quality Service

There is a **Packard** for Every Service

Indoor and Outdoor



1500 K.V.A.
66000-2310/13860 Volt
Three Phase
60 Cycle 40 deg. C Temperature Rise Self Cooled Transformers

Insulation Test 165000 Volts

One of Three for the City of St. John, N.B.

Foundations of Continuous Service

The Packard Electric Co., Limited

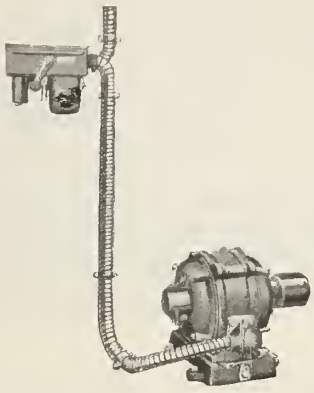
St. Catharines, Ontario

Room 308-9, 7 Adelaide St. W., Toronto **421 Power Building, Montreal**
703 Confederation Life Building, Winnipeg

Agents:

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"TRISTEEL"

To use anything but Tristeel on jobs like the above or on the hundred and one similar jobs for which Tristeel is especially designed is to sacrifice both efficiency and appearance.

Send a trial order and test it out. Sizes 5/16″ to 2″ carried in stock.

Immediate delivery guaranteed

Selling Agents—

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33 Labatt Avenue, TORONTO

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COCHRANE STEPHENSON CO.

WINNIPEG - VANCOUVER



The Call Went Out—

O-G-W-P

—and a good many sent in their orders for

Universal Guy Wire Protectors

Because—

The Universal saves time on the line—and saves money too.

The Universal does away with make-shifts—unsightly jobs.

The Universal prevents rust.

The Universal lasts as long as the guy.

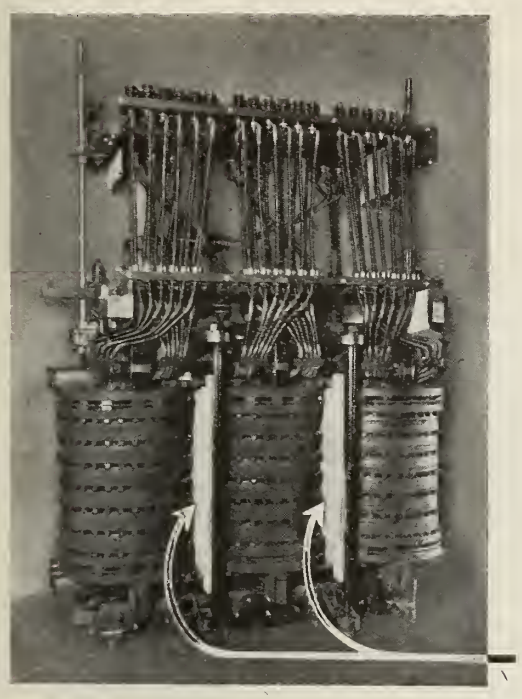
The Universal is a good buy—

—So We Want Your Order



N. Slater Co. Limited

Hamilton, Canada



Packard

Transformers

are built for satisfaction and take advantage of the wonderful properties of

Diamond-Fibre Insulating Pads

When Mr. Frank T. Wyman, president of the Packard Electric Company of St. Catharines, uses Diamond Fibre pads between the coils in the well known Packard Transformer, he does so after careful consideration.

These Fibre pads have a very high dielectric strength and are absolutely unaffected by the oil in which they are totally immersed in a transformer of this type.

F Diamond-F

DIAMOND FIBRE

VISIT US AT THE TORONTO "EX"
YOU WILL FIND US IN BOOTH 80A INDUSTRIAL BUILDING AND IN THE MACHINERY BUILDING. Come and see Diamond Fibre in actual use.

DIAMOND STATE FIBRE COMPANY OF CANADA, LTD. TORONTO, ONT.

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Rubber Covered Wires and Cables

FOR POWER, LIGHT AND TELEPHONE WORK

Incandescent Lamp Cord, Flexible Switchboard Cables, Special Cords and Cables for all kinds of Electrical Work.

Prompt Shipments from Canadian Factory.

BOSTON INSULATED WIRE & CABLE CO., Limited

Canadian Office and Factory, HAMILTON, ONT.

GALVADUCT



LORICATED

A Galvaduct Building
Physicians and Surgeons Building, Toronto
Roxborough and Dean, Electrical Contractors

"GALVADUCT"

The most perfect interior construction conduit on the market.

Recognized as the standard of high quality.

Always specify Galvaduct or Loricated CONDUITS.

"LORICATED"

A high-class interior construction conduit of the enameled type, proof against acid or other corrosive agents.

If your jobber cannot supply you—write us.

CONDUITS COMPANY LIMITED

Head Office and Factory—Toronto

Western Sales Offices: Winnipeg and Vancouver

1060 Series



Supplied in Cased-Glass

	Diam.	Depth	Fitter
No. 1060 —	12″	7″	6″
No. 1061 —	14″	8″	6″
No. 1062 —	16″	9″	6″
No. 1063 —	18″	10″	8″

Jefferson
MADE IN CANADA

LIGHTING UNITS

FOR EVERY REQUIREMENT

396 Series



Supplied in Moonstone R. I. or Cased-Glass

	Diam.	Depth	Fitter
No. 396 —	16″	10″	6″
No. 397 —	10″	10½″	6″
No. 398 —	12″	14″	6″

555 Series



Supplied in Cased-Glass, Sol-Lux, or etched design 167—Sepia

	Diam.	Depth	Fitter
No. 555 —	15¾″	8″	6″
No. 556 —	13″	8″	6″
No. 557 —	10″	8″	6″

550 Series



Crystal Enamelled

	Diam.	Depth	Fitter
No. 550 —	13″	8½″	6″
No. 551 —	15⅞″	11½″	6″

515 Series



Supplied in Cased-Glass, Sol-Lux, or etched design 166, as illustrated

	Diam.	Depth	Fitter
No. 515 —	10″	9¼″	6″
No. 516 —	14″	10″	6″
No. 517 —	12″	14″	6″

JEFFERSON GLASS CO.

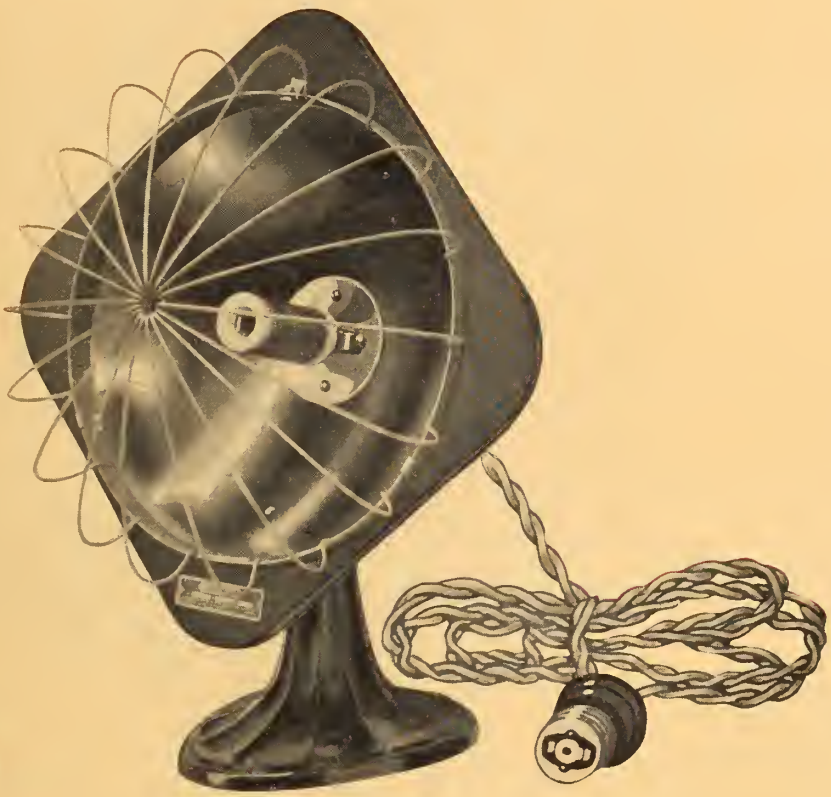
Limited

Head Office and Factory:
388 Carlaw Avenue, - TORONTO

Prices to Electric Trade Only
On Request

We Sell The Glassware Only

Hotpoint





HEDLITE HEATER

"Warms as the sun warms"

The season for this appliance is fast approaching. The first cool fall evenings will be the signal for a large demand for Hotpoint Hedlite Heaters.

Dealers, who have their stock of Hedlite Heaters ready, will naturally benefit most by this demand. We can make immediate shipments from stock, and would strongly recommend that you place your order early as invariably a shortage of heaters is witnessed at the time when a supply is most needed. Your jobber or our nearest Sales Branch can supply you.

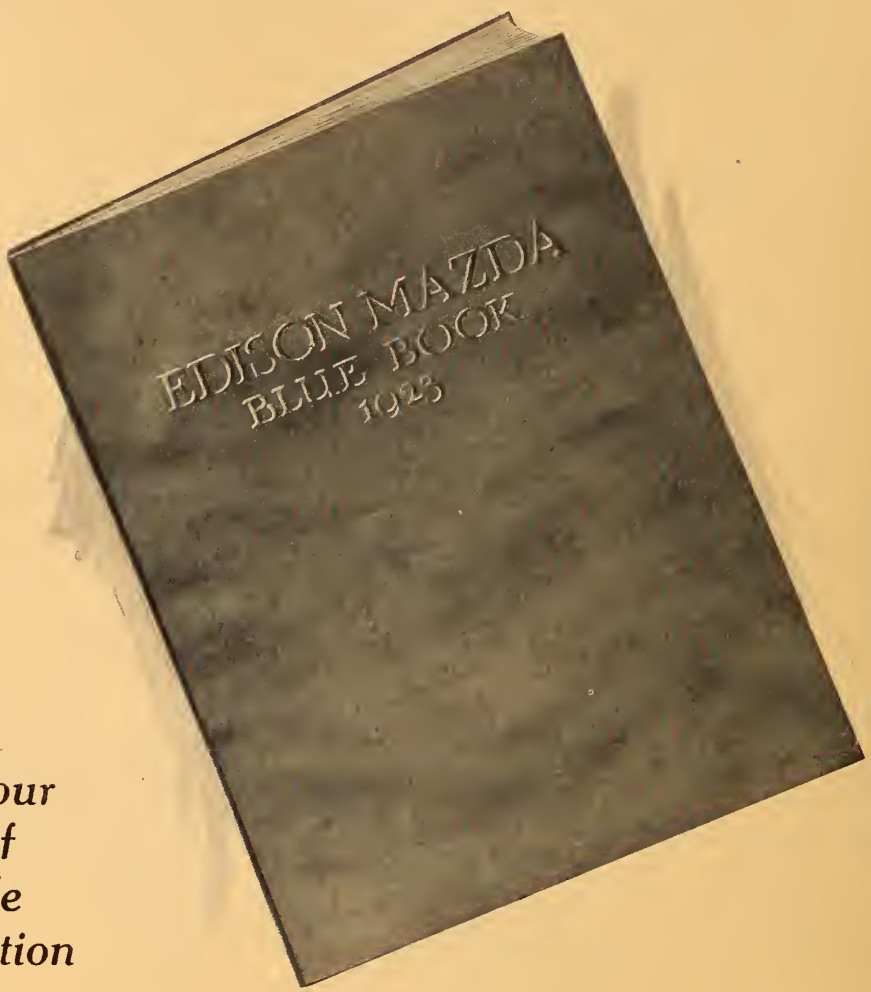
"Made in Canada" by

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited

EDISON MAZDA



Sixty Four Pages of Valuable Information

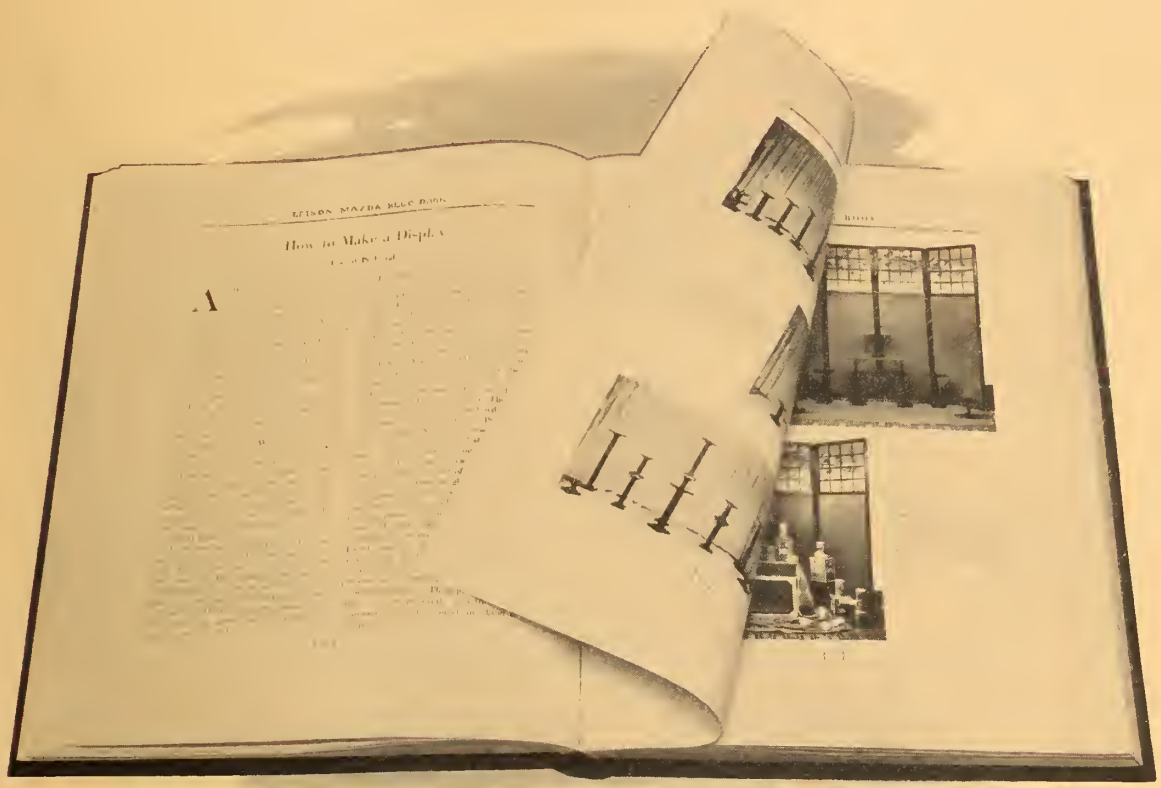
Illustrated above is a sixty four page book, containing a complete description of the Edison Mazda Lamp Advertising Campaign for the coming season. This book is unique in many respects, while it is not intended as a complete course in the art of advertising, yet it contains much valuable information, and many fundamental facts a dealer should have at his finger tips.

EDISON LAMP WORKS

of

Canadian General Electric Co. Limited

BLUE BOOK



Hints on Window Dressing

Local Campaigns, Advertising and Merchandising

In addition to complete information regarding national advertising for Edison Mazda Lamps, the Blue Book contains many chapters dealing with such subjects, as, "Who pays for advertising," "For the dealer who favors unadvertised goods," "Window Displays," "How to make a display," "Home Lighting Campaign," "Ideas that have brought business," "Mailing List," etc.

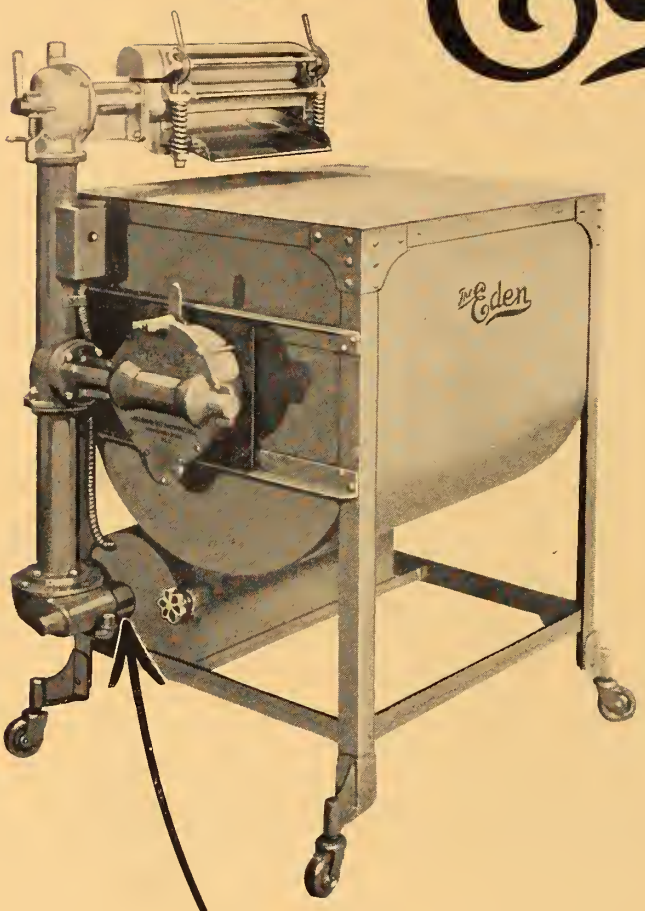
Every Edison Mazda Lamp Agent in Canada will receive a copy, of the Blue Book, about the first week in September. Should you, however, not be an Edison Mazda Lamp Agent, and would like to receive a copy, write to our nearest sales branch, or direct to the Lamp Sales Department, Canadian General Electric Co. Ltd., Head Office, Toronto.

EDISON LAMP WORKS

of

Canadian General Electric Co. Limited

The Eden



Model "K" Machine Powered by C.G.E. Motors

In addition to the above this machine embodies a number of interesting features, among which are:—

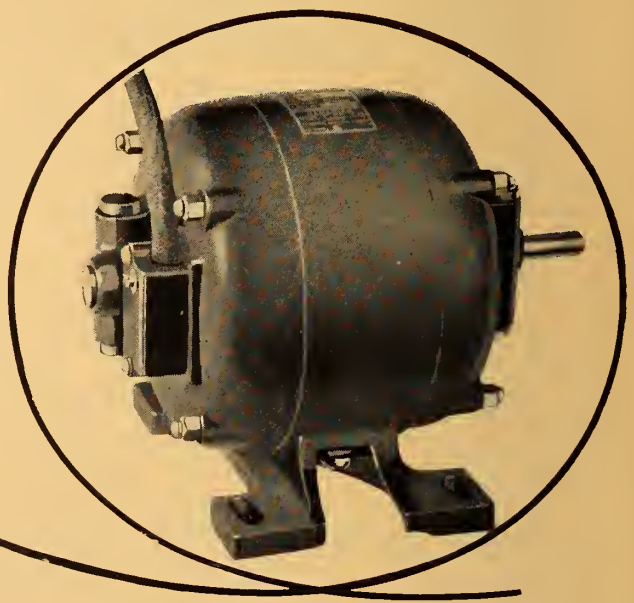
A solid Aluminum, hinged wringer of new design.

Tension Springs Wringing heavy or light articles without readjustment.

A Splash-proof switch mounted on the machine.

The Sanitary sediment zone is an exclusive EDEN feature.

These new and attractive features together with the celebrated C.G.E. motor make the Eden machine mechanically perfect.



C. G. E. Time Payment Plan

The new time payment plan is proving very popular with the electrical trade. If you have not already received particulars, our nearest branch manager will be more than pleased to supply you.

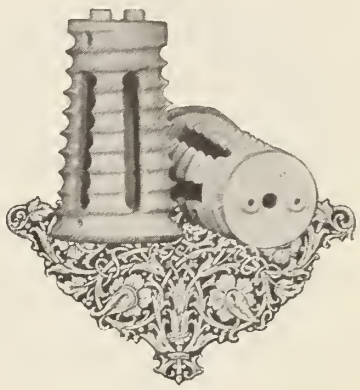
Eden Washing Machines are stocked at our different sales branches, throughout the Dominion. The sales branch you do business with will be glad to supply list prices, and explain the attractive dealer discounts.

Canadian General Electric Co., Limited

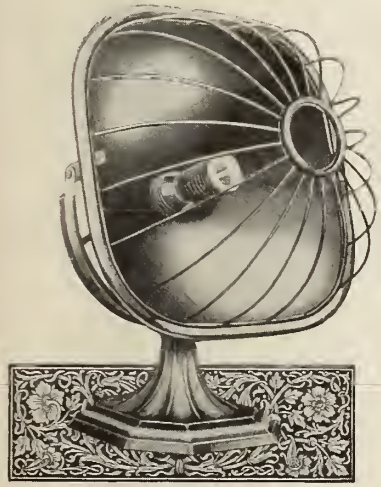
HEAD OFFICE TORONTO

Branch Offices: Halifax, Sydney, St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

L&H REFLECTOR HEATERS use ELEMITE



DOUBTLESS the outstanding reason for the marked success of the L & H Reflector Heater is its dependable heating element. The reputation of A. J. Lindeman & Hoverson Co. of Milwaukee, prominent manufacturers of Stoves, Ranges and Sheet Metal Ware since 1890, demands "quality materials" throughout. Significant verification of the rigid R & L policy will be found in the fact that heating units of all R & L Reflector Heaters are based on ELEMITE porcelain cores



ELEMITE FOR LONG SERVICE

ELEMITE is the one dependable porcelain structure suitable for use in the heating element of Quality electrical appliances. It is Flexible. Will expand and contract with temperature changes, without cracking. Will pass the most severe temperature test ever imposed on porcelain. Elemite is produced in special shapes to the exact specification of customer.

Send sketch or model for cost estimates.
Write for samples for testing

THE LOUTHAN MANUFACTURING CO.
EAST LIVERPOOL, OHIO
FACTORIES
EAST LIVERPOOL, O. LAUGHLIN, O.

MOLONEY



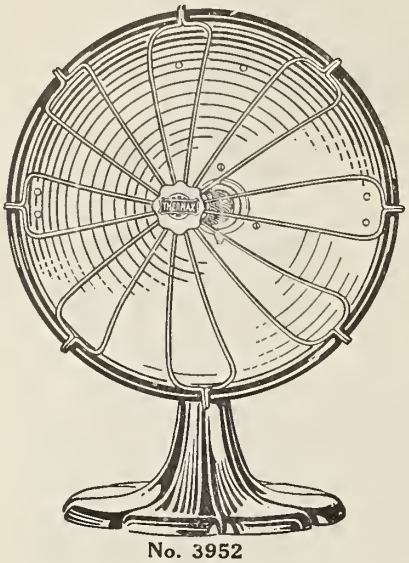
Write for bulletins. They should be in your files.

The "service" advantages to be gained from the use of Moloney transformers far outweigh the "price" advantage of cheaper equipment. Moloney transformers are made up to a standard, not down to a price. Only the most suitable materials and the highest skilled workmanship are used—and this, together with their acknowledged leadership in design, forms the real reason for their advancing popularity.

A Truly Canadian-Made Product

MOLONEY ELECTRIC COMPANY OF CANADA, LTD.

Factory and Head Office: 213-219 Sterling Rd., Toronto, Ont.
Branch Offices: Montreal, Halifax, Winnipeg
Agents: General Supplies Co., Calgary, Alta. Frank Darling, Vancouver and Victoria, B.C.



No. 3952

PREPARE

The Fall Season will soon be here with the usual sudden **demand** for Heaters and Heating Devices.

Dont be caught! Assure Yourself of delivery—by ordering **now**—with any shipping date you desire.

Our proposition on Portable Heaters is the best we have ever offered.

Write us at once for full details.

GREAT WEST ELECTRIC CO., LIMITED

87 KING ST., WINNIPEG

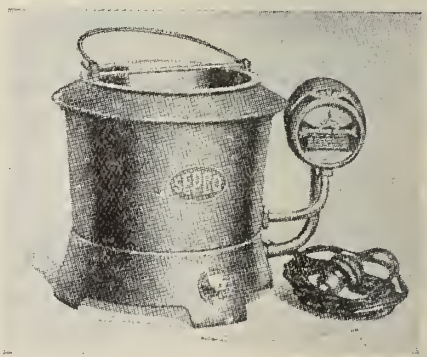
Sepco AUTOMATIC ELECTRIC

GLUE POT

The necessity of maintaining glue at a temperature of 140-150 degrees in order to obtain the maximum efficiency is well recognized—so well recognized in fact that more than seven thousand **Sepco** Automatic Electric Glue Pots are now in use for that very purpose.

But the **Sepco** has other advantages too. It saves the workmen's time. It eliminates losses through spoilage of work due to over-cooked or underheated glue. It can be used for heating or melting wax, pitch, tar, rosin, etc., and it can be left on over night in absolute safety.

Made in Canada and fully guaranteed.



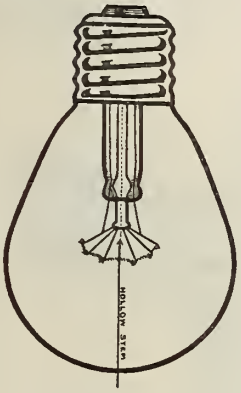
Write for full details

SEPCO AUTOMATIC HEATERS

LIMITED

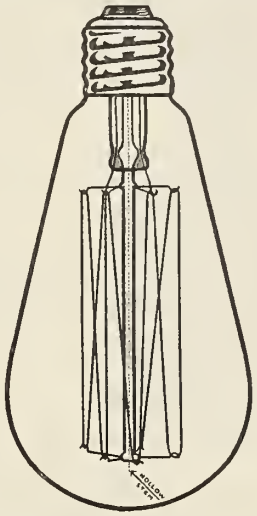
47 Richmond St. E. Toronto, Ont.

TIPLESS *Dalyte Holo-Stem* LAMPS



The development of DALYTE "HOLO-STEM" TIPLESS lamps marks the greatest advance in the art of incandescent lamp manufacture since tungsten alloy metal filaments were produced.

DALYTE "HOLO-STEM" TIPLESS lamps are protected by Wheeler Patent Pending, also by Trade-mark Registered, and are manufactured only by Dalyte Electric Ltd., Guelph, Canada.

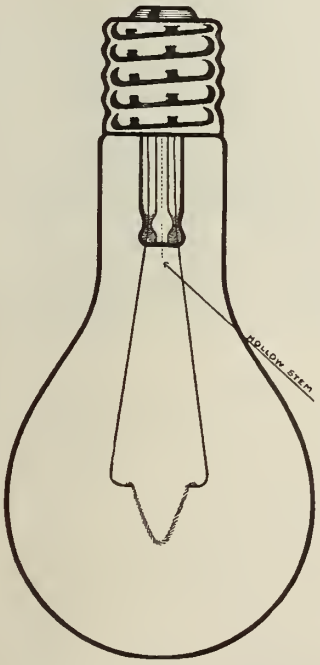


DALYTE "HOLO-STEM" TIPLESS lamps are made in all types and sizes from 5 watt to 1,000 watt, and the quality is positively unexcelled.

The "HOLO-STEM" method of construction is entirely new and novel and absolutely eliminates the glass stresses that are so prevalent in other makes of tipless lamps.

The demand for DALYTE "HOLO-STEM" TIPLESS lamps is already enormous, and in order that you be prepared to meet it, would suggest that you get in early communication with our nearest branch or Distributor—the list of same follows:

Dalyte Electric Ltd., 325 Howe St., Vancouver. Dalyte Electric Ltd., 556 Aylmer St., Montreal.



Dalyte Elecric Ltd., 163½ Church St., Toronto.

Dalyte Electric Ltd., Sanford & Main Sts., Hamilton.

Sumner & Co. Ltd., Moncton, N. B.

H. M. Hopper, 57 Dock St., St. John, N.B.

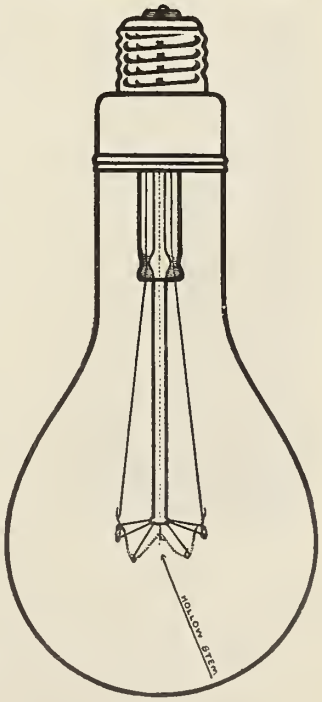
La Cie des Nouveautes "UNIVERSEL", 211 rue Des Fosses, Quebec City.

E. H. Briggs & Co., 619 Avenue Bldg., Winnipeg, Man.

Stratton-Steward Ltd., 239—10th Ave. E, Calgary, Alta.

The Western Lighting Agencies, 109—23rd St. E, Saskatoon, Sask.

Midland Electric Co. Ltd., 3129—10th Ave., Regina, Sask.

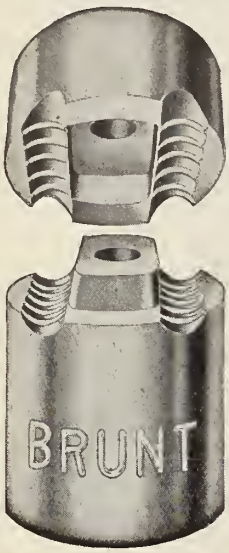


Head Office and Factory:

Dalyte Electric Limited

Guelph, Ont., Canada

BRUNT



HIGHEST QUALITY

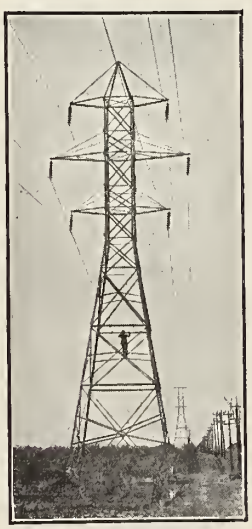
PORCELAIN

KNOBS
TUBES
CLEATS
AND
SPECIALTIES

CANADIAN REPRESENTATIVES
Duggan Import Sales Co.,
162 King Street, West,
Toronto, Ontario
Russell Fowler Co.,
306 Notre Dame Avenue,
Winnipeg, Man.

THE BRUNT PORCELAIN CO.
Columbus Ohio

GALVANIZED STEEL
TOWERS AND POLES



Standard Tower Hydro
Electric Power Commission of Ontario

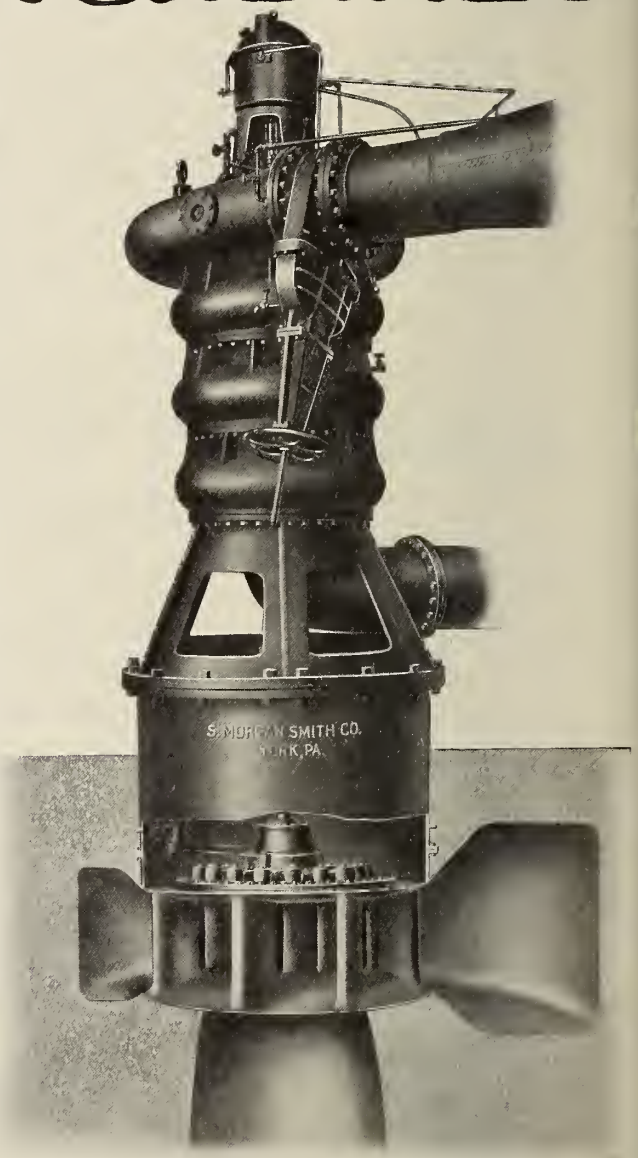
The modern means of supporting overhead wires.

Power
Telephone
and
Trolley
Lines

We shall be pleased to furnish designs and estimates upon request.

The Canadian Bridge Co., Limited
Walkerville, Ontario, Canada
Structural Steel of all Kinds
Montreal Office in New Birks Building.

SMITH
HYDRAULIC
TURBINES



Above illustration shows Smith turbine operating under 21 feet, driving direct connected vertical shaft four-stage pump delivering 7500 gallons per minute against 78 ft. lift, for irrigation purposes, installed by U.S. Reclamation Service.

Bulletin "N" shows many uses to which Smith Turbines may be adapted.

S. MORGAN SMITH CO., York, Pa.
H. B. Van Every, Representative, 405 Power Bldg., Montreal

The Star Porcelain Company

TRENTON, N. J.

Manufacturers of Electrical Porcelain Specialties. Also specialize in the manufacture of heater bricks for electric ranges.

CANADIAN PORCELAIN CO.

LIMITED

HAMILTON - CANADA

Manufacturers of High and Low Tension Porcelain Insulators



Kyle Boring Machine

Bores holes at any angle.
Adjustable 4½ to 13½ feet.
Price $29.00

One Montreal Dealer says:
"Just the machine I wanted."

Another Dealer says:
"Saved the price of two machines on one job."

Distributors wanted.

Ren Automotive Supply Co. Ltd.
Preston, Ontario

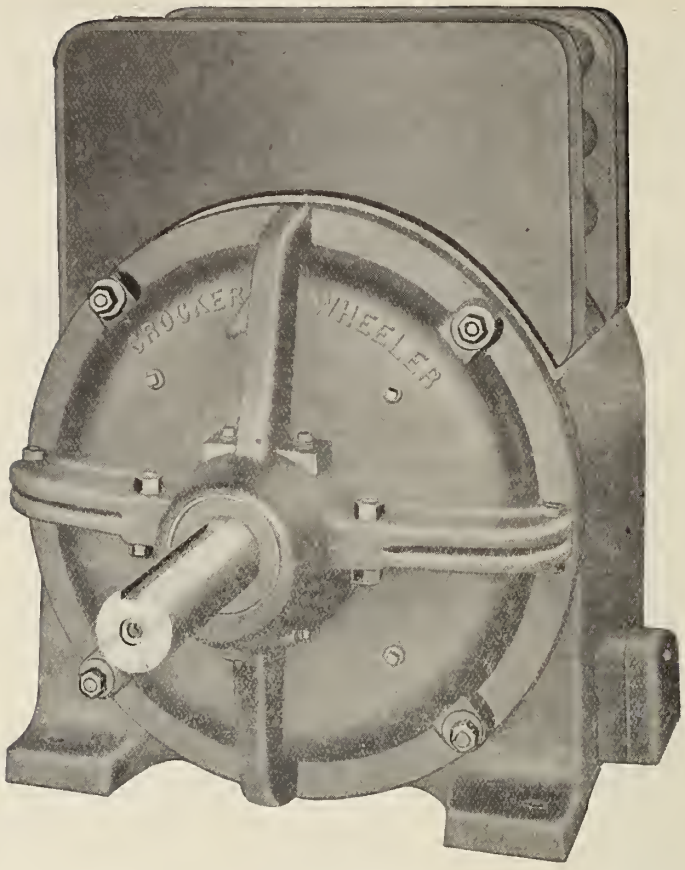
International Business Machines Company

LIMITED

300 Campbell Ave., Toronto

Manufacturers of International Electric Time Systems, comprising Master Clocks, Secondary Wall Clocks, Bell-ringing Programme Devices and Automatic Charging Cabinets.

Complete Electric Time Systems for Schools, Colleges, Public Institutions, Office Buildings, Factories, etc.



30 h.p. 750 r.p.m., 550 volts, 3 phase, 25 cycles, Canadian Crocker-Wheeler totally enclosed Motor, supplied to H. E. P. C. for use on Chippawa development

Ready for work in a sand storm---totally enclosed

Under practically any conceivable circumstances where power is needed we can place a Canadian Crocker-Wheeler to do the work. The type of motor shown above was required to work in the open, exposed to rain, sun and snow and particularly to clouds of rock and concrete dust. The Crocker-Wheeler cast welded Rotor used ensured continuity of service and the special piped cover designed ensured complete protection for the motor, with ample cooling surface to dissipate excess heat.

THE CANADIAN
CROCKER-WHEELER CO.
LIMITED

Manufacturers and Electrical Engineers

Head Office and Works:
ST. CATHARINES. Ont.

District Offices:
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Also all Branches of

Northern Electric Company
LIMITED

Montreal, Halifax, Quebec, Toronto, Hamilton, London, Windsor, Winnipeg, Regina, Calgary, Edmonton, Vancouver.

"Reel Service"

From Coast to Coast

Canada Wire & Cable Co. Limited

Halifax Montreal Toronto Regina
Winnipeg Calgary Vancouver

MANUFACTURERS OF
Copper
Bare, Weatherproof, Rubber Covered

Electrical Wires and Cables

and STEEL WIRE ROPE



Adjustment

ONE disadvantage of the fuse is that its blowing point is not subject to adjustment.

The only way to change it is to get a different fuse. Contrast this with the U-RE-LITE, its operating point may be readily adjusted to any desired current within a wide range, as for instance in the 20 ampere capacity, from 15 to 30 amperes, other other sizes in proportion. Once set, its operation thereafter is constant and invariable, and enclosed within a steel case, is not subject to unauthorized changes.

The CUTTER COMPANY
ESTABLISHED 1888 PHILADELPHIA

24 Adelaide St., E., TORONTO

Interior Telephones

for

Apartment House, Factory, School, Hospital, Office

Electric Reset Annunciators and Signal Specialties

Hospital Signal System

A complete new silent call system for hospitals. Registers at nurses' quarters and office with time record, if wanted.

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Cochrane, Stephenson & Co. Ltd.,
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Vancouver, B.C.

Timberlake & Bourne
New Birks Bldg.,
Montreal, Quebec

The Pierce Electric Company,
104 Richmond St. West,
Toronto, Ontario

CONNECTICUT TELEPHONE & ELECTRIC COMPANY
MERIDEN CONNECTICUT

MICA

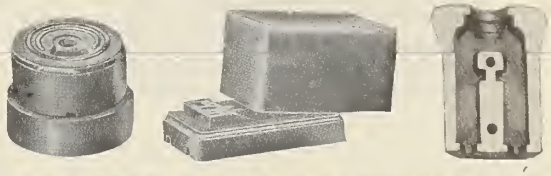
KENT BROTHERS

Kingston, Ont., Canada

Miners, Exporters and Dealers in Canadian Amber Mica.
Thumb Trimmed, Cut to Size, Splittings, Discs, Washers, Etc.

Write us for prices and let us figure on your requirements.

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AMERICAN INSULATOR CORPORATION
New Freedom, Pa., U.S.A.
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G. L. MacGILLIVRAY & CO., LIMITED
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Heating and Cooking Device Manufacturers

Permit us to solve all your Resistance material problems.

Brightray and Redray, the iron free alloys are being increasingly used for all high temperature service: Glowray and Dullray for the lower heats.

These materials, like our other resistance products are specified by the British Admiralty, a fact which stamps them with the Hall Mark of **quality** and **reliability.**

Our Resistance Materials cost no more and are stocked in Montreal by our—

Canadian Distributors

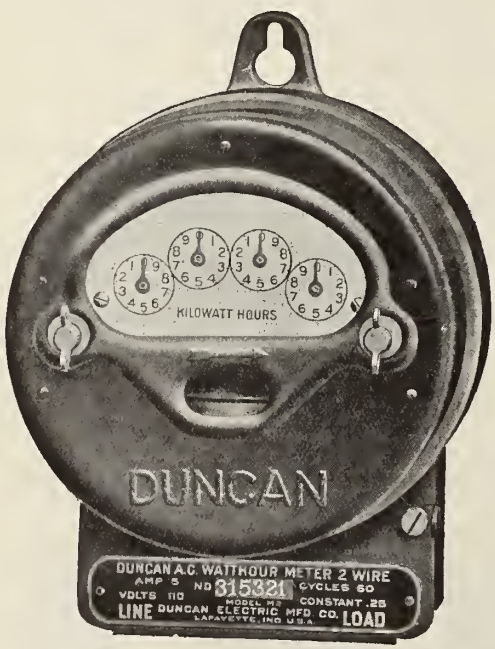
WOODBURN'S LIMITED

Telephone Main 1790

137 McGill Street **Montreal, Que.**

Made by

Henry Wiggin & Co. Ltd., 55 George St. Parade, Birmingham, England



DUNCAN

Watthour Meters

for Sustained Accuracy

Through Years of Service

THE GEORGE C. ROUGH SALES CORP'N. 134 CORISTINE BLD'G. **MONTREAL**

CANADIAN PRODUCTS

ARMOURED CONDUCTORS

TWIN AND THREE-CONDUCTOR
IN SIZES, NO. 14, 12, 10, 8 AND 6

FLEXIBLE STEEL CONDUIT

$\frac{3}{8}''$, $\frac{1}{2}''$, and $\frac{3}{4}''$

Look for the identification mark (L N) stamped every two and a half inches on all our steel products.

NON-METALLIC FLEXIBLE CONDUIT

TRADE MARK
Loomduct
REGISTERED

A single wall Conduit of unusual flexibility

SIZES

$\frac{1}{4}''$, $\frac{3}{8}''$
$\frac{1}{2}''$, $\frac{5}{8}''$
$\frac{3}{4}''$ & $1''$

TRADE MARK
Insuladuct
REGISTERED

A double wall Conduit that has stood the test of time

FIBRE TWINES AND CORDAGE

Made from the highest grade Kraft and suitable for the manufacturing of all products in which paper is used

TORONTO
Robert G. Ross
701 Eastern Ave.
Telephone
Gerrard 467

The L. & N. Co. Limited
ST. JOHNS, QUE.

WINNIPEG
Fred E. Garrett & Co.
607 Union Trust Building

The Westinghouse Type W Electric Range



Never before have dealers had the opportunity to display an electric range with so many good selling points as the new Westinghouse Type W.

For appearance alone this range is in a distinctive class all its own and will attract both a select and large patronage. Those who desire a mechanical demonstration will appreciate its many exclusive features, some of which are:

Seamless, porcelain enamel-lined oven with all parts removable.
Top heaters removable without disconnecting any wires.
Fuses readily accessible.
Switches rotate in either direction.
Solid bus-bar construction.
Two area, top heating units.

Ask nearest office for full particulars.

Canadian Westinghouse Co., Limited, Hamilton, Ontario

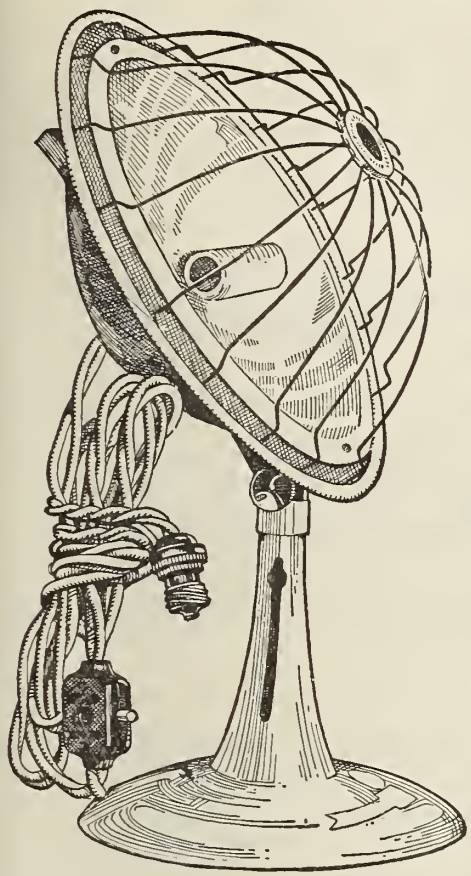
TORONTO, Bank of Hamilton Bldg.
HALIFAX, 105 Hollis St.
CALGARY, Canada Life Bldg.
MONTREAL 285 Beaver Hall Hill
FT. WILLIAM, Cuthbertson Block
VANCOUVER, Bank of Ottawa Bldg.
WINNIPEG, 158 Portage Ave. E.
EDMONTON, 211 McLeod Bldg.
OTTAWA, Ahearn & Soper, Ltd.

Repair Shops

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WINNIPEG, 158 Portage Ave., E.
VANCOUVER 1090 Mainland St.
TORONTO, 366 Adelaide St. W.
CALGARY, 320 8th Avenue West

CANADIAN WESTINGHOUSE

Westinghouse



Big Cash Prizes

For Window Displays During "Majestic Week"

SEPTEMBER will witness a great impetus in Majestic Electric Heater sales. We want every dealer to get in on this business, by stocking and displaying "Majestics" in the most effective manner possible.

To encourage attractive displays, we are again offering $125 in Cash Prizes for the best window salesmanship schemes evolved by dealers handling Majestic Heaters. This contest will be held during

"Majestic Week" September 10th to 17th

Last year's similar contest was a huge success. Get your windows in as early in September as possible this year. The photographs must, of course, be taken during "Majestic Week", and they will be judged by The James Fisher Company, 384 Yonge St., Toronto. The contest closes on October 8th. In submitting photographs, be sure to state **when** you dressed your window and **how long** it remained.

Cash in on New Business

Remember—the selling idea behind the window display is what will count, not your ability to take a good photograph. You can develop numerous sales during this contest. Our big newspaper and magazine advertising campaign will be sending many new heater prospects in your direction. An attractive window will enable you to cash in on this new business. Note the Prizes:

1st Cash Prize	—	$50.00
2nd " "	—	25.00
3rd " "	—	15.00
4th " "	—	10.00
Five Prizes, each		5.00

A New Heater Added

Majestic Heaters are more attractive than ever this Fall. The No. 8 two-coil Heater has a larger reflector. A new type has been added—the "Little Canadian Beauty," selling at $6.75. It will sell like hot cakes!

Three Benefits to You

Get busy **early** on a bang-up window display. It will bring you business, put you in line for a Cash Prize and also for the valuable Free Premiums!

Renfrew Electric Products, Limited

Makers of Majestic Heaters and Grates. Also "Canadian Beauty" Electrical Appliances—Irons, Toasters, Grills, Percolators, etc.

General Sales Offices:
29 Richmond St. West, Toronto

Factories:
Renfrew, Ontario

Majestic Electric Heaters

Canadian Armature Works

St. Catharines, Ontario, Canada

Night phone: 1496 Day phone: 223

Electrical Repairs Power Installations

Manufacturers

Motors Commutators Transformers

Coils for railway equipment

Armatures rewound, any type of coil manufactured

Write us for prices on
Motors, Coils and Repairs

Let us figure on your requirements

Do You Realize

that day after day switchboard instruments continually indicate the current and potential of a circuit and require careful construction to withstand this service and remain accurate?

NORTON

Ammeters and Voltmeters are of the

Highest Accuracy
and
Unequalled Durability

They are the result of years devoted to scientific construction by skilled men, who have made instrument building their life's effort.

Write for latest booklet.

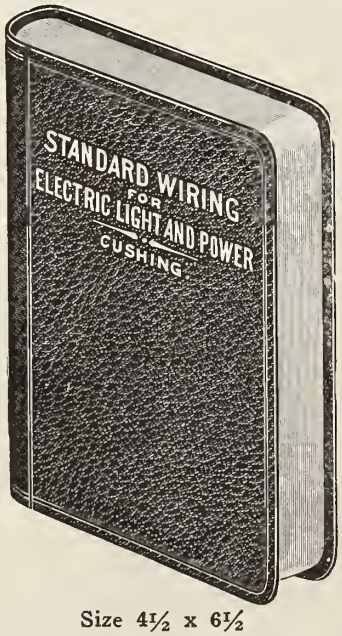
Norton Electrical Instrument Co.

61 Hilliard St. Manchester, Conn., U.S.A.

(*Builders of ammeters and voltmeters for over a quarter of a century*)

The Acknowledged Authority on Electric Light and Power Wiring and Construction

The above is the opinion of a prominent official of the Hydro Commission



Size 4½ x 6½

"Standard Wiring"

ENDORSED BY THE WIRING DEPARTMENT OF THE JOINT COMMITTEE FOR BUSINESS DEVELOPMENT IN THE MOVEMENT TO "ELECTRIFY."

This latest edition contains over twice the amount of useful information ever before published. The National Electrical Code explained and illustrated. New illustrated chapters on Outside Wiring and Inside Wiring for all systems for both direct and alternating currents; House and Residence Wiring, Garage Wiring, Theatre and Moving Picture House Wiring, Marine Wiring, Electric Sign Wiring.

How to install, operate and care for Generators, Motors, Storage Batteries, Meters, Electric Ranges and every kind of wiring device for light, heat and power. How to secure the proper illumination for every condition; latest Mazda lamp data; 250 electric terms and their definition and values; the complete Metric system; fifty-two of the latest tables on wires and wiring; all dimensions, weights and capacities of wires and cables for copper, brass and iron; tables, showing at a glance, and without any figuring, the right size of wire for power or lighting jobs for any capacity. New edition just out.

400 pages—illustrated—leatherette cover—gilt edges
pocket size—price $2.00

Sent to any address, post paid, on receipt of price

Electrical News, 347 Adelaide Street West, Toronto, Canada

QUALITY RADIO SUPPLIES

We stock only the most reputable lines such as:

Frost	Atwater Kent Co.	Homecharger
Brown	Howard Radio Co.	Valley Charger
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U. S. Tool	Burgess Batteries	Westinghouse Sets
Murdock	Eveready Batteries	Marconi Wireless Co.
Magnavox	Condensite Celoron	Can. Indept. Tel. Co.

Write for price list *Discount Sheet to Dealers*

TORONTO RADIO COMPANY
62 Yonge St. Arcade Toronto, Ont.

COSTS

MAY BE REDUCED BY EMPLOYMENT OF
ALUMINIUM
NOT ONLY BY THE USE OF CASTINGS FOR HEAVY ELECTRICAL MACHINES BUT ALSO BY UTILIZING ROD, BAR, TUBE AND SHEET FOR INSTALLATIONS AND INSTRUMENTS

THE
BRITISH ALUMINIUM CO. LIMITED
592 KING ST. W. TORONTO

KLITZEN

REGENERATIVE—
Receiving Sets

Real Radio Simplicity

Only one adjustment

Licensed under Armstrong Patents

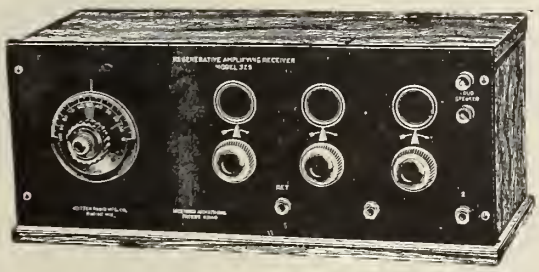
The principal feature of No. 525 Regenerative Tuner Detector, 2-stage audio amplifier is SIMPLICITY.

Any operator can get wonderful results because there is only one adjustment. Receiving Range practically the same as that of the best radiophone equipment on the market.

Each unit carefully tested before shipment. The best material and most highly skilled workmanship employed—it is the product of experts who have been making radio equipment since 1913.

JOBBERS AND DISTRIBUTORS. Write for full information and big discounts. DEALERS—ask your jobber or write us.

KLITZEN RADIO MFG. CO., Inc.
Racine, Wis.



MODEL No. 525 LIST PRICE **$80.00**



Cash in on the Widespread Demand for Better Audio Frequency Amplification

New circuits, new conditions in radio, have created a world-wide, active, *insistent* demand for more efficient audio frequency amplification.

The "United" Audio-Frequency Amplifying Transformer

by its performance, under an amazing variety of hookups, combinations and climates, has made a distinguished place for it in the whole radio industry, at home and abroad.

Our national advertising has amplified this national demand.

Jobbers and Retailers who are alert to their own best interests will lose no time in ordering liberal stocks while we are still able to keep step with our orders.

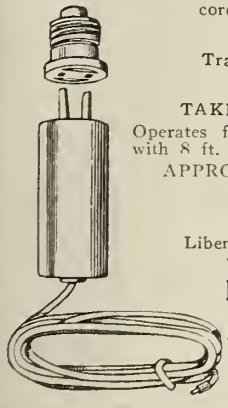
The United Transformer is magnetically shielded, sturdily built, attractively finished in black enamel and nickel plate.

Ratio 5 to 1—a quick—turnover seller in the U. S. at $4 50.

Sen l for our liberal quantity discounts on transformers and complete line of condensers.

United Mfg. & Dist. Co.
9705 Cottage Grove Ave., Chicago, Ill.
New York Office: 50 Church St., New York, N. Y.
San Francisco Office: 709 Mission St., San Francisco, Calif.

You wouldn't buy an automobile without a self starter. When you buy an Antenna Plug insist on one complete with a handsome cord. Buy the original.



Trade "NO AERIAL" RAD-O-PLUG Mark

TAKES THE PLACE OF AN AERIAL
Operates from any electric light socket. Complete with 8 ft. cord.
APPROVED BY NATIONAL BOARD OF FIRE UNDERWRITERS
PRICE $2.50
Liberal discounts to jobbers and dealers
Write for circulars Agencies Open

Radio Products Corporation
Manufacturers Distributors
8926 Clarendon Ave., Detroit, Mich.
Representative for Western Canada:
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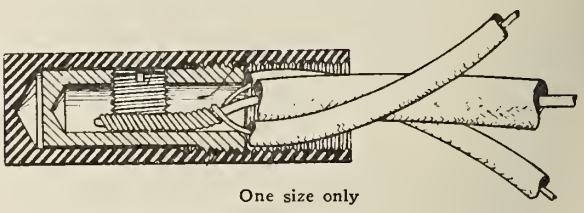
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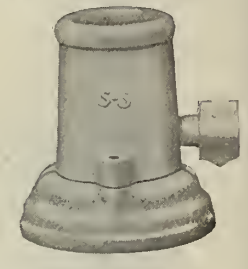
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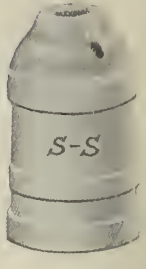


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This two color attractive space is available from our issue of September 1st onwards at a cost of only $60.00 per inch, per year of 24 issues reaching 3,500 electrical men throughout Canada. The above firms whose cards are shown find this small space especially valuable and many of them have been with us for years.

Write to-day!

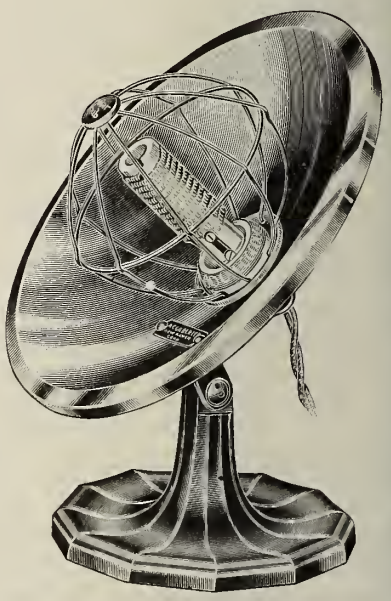
Electrical News
349 Adelaide Street West, Toronto

Polar Cub
ELECTRICAL PRODUCTS

Consider for a moment the great mass of people in the territory from which you draw your customers who have been unable to purchase many electrical items because they could not afford them! Then realize that this great market is yours with Polar Cub Electrical Products. Everyone who uses electricity may use Polar Cub items and every size of pocket-book can afford Polar Cub.

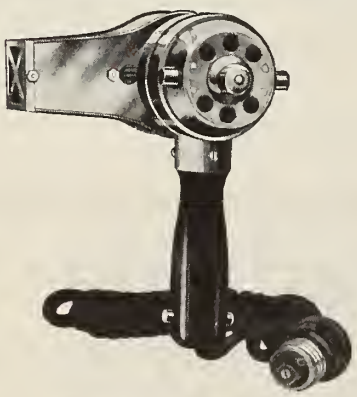
The name "Polar Cub" on electrical merchandise is becoming better known every day the world over. The pioneer in the small electric fan field, its growth has been phenomenal until today it leads all others in low priced, high grade electrical utility items.

Remember, in offering Polar Cub Products to your trade, you are not only opening the way to splendid profits to yourself but you are presenting electrical items that have been tried and found practical—items at popular prices, at the same time high in quality and backed by an unquestioned guarantee.

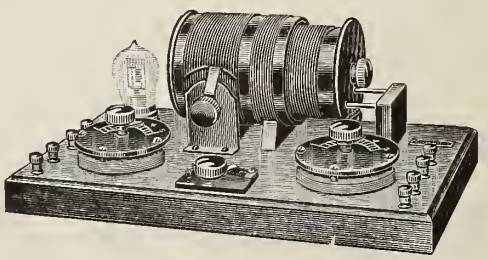


B90 New Polar Cub Heater, Retails $7.50

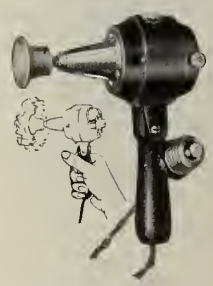
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B92 Polar Cub Hair Dryer, Retails $14.50



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4055 Headphones Retail $6.75

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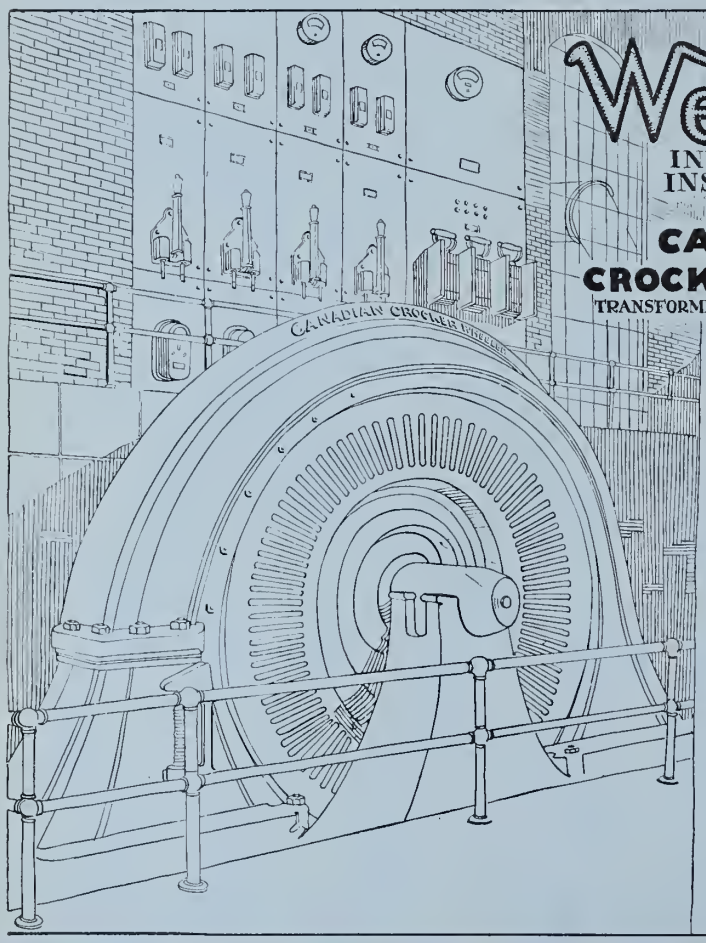
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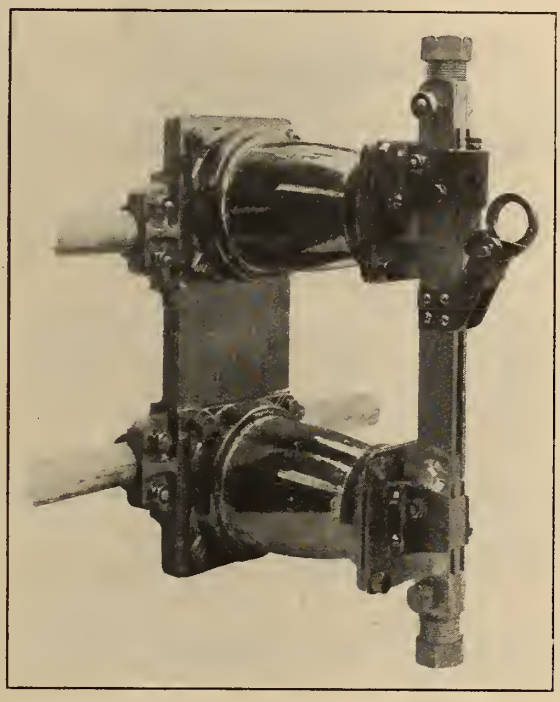
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HEAVY DUTY DISCONNECTS, as supplied to the Hydro Power Commission of Ontario comprising:-

1. Jig assembled interchangeable Porcelain units—the same units are also applied for bus bar supports.
2. Substantial Locks.
3. Large eye release for pole operation.
4. Straight through contact jaws—**joints and right angle bends eliminated.**

   Note: With the omission of the right angle bends, the heavy magnetic field is eliminated when under short circuit conditions.
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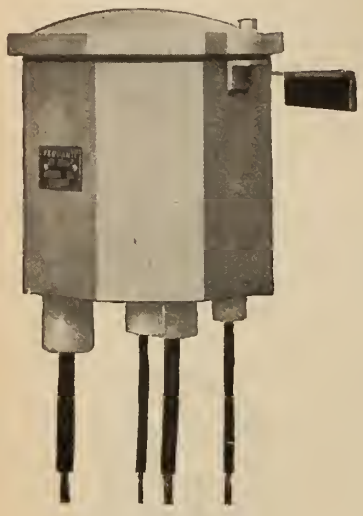
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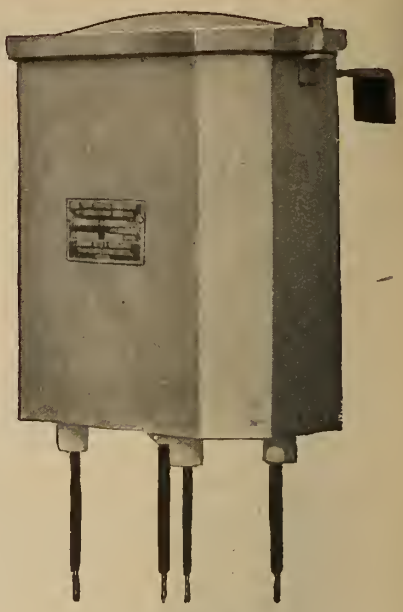
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1. Strong pipe bracket, angle iron scroll and brace, solid welds, no screws.
2. Fire enamelled reflector over 20″ diameter, flat reflecting faces, greatly improved distribution and efficiency.
3. Cast iron canopy and adjustable socket.
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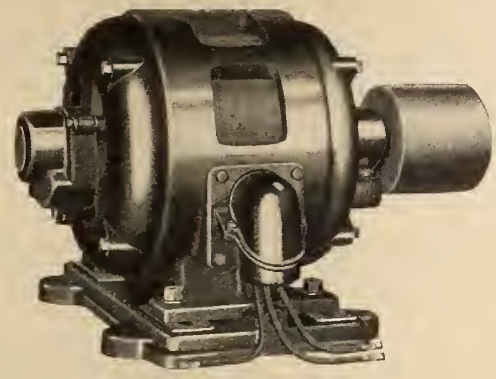
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Only for Motor Dealers

Last month we announced "The Motors That Breathe"—our new Type "L" Polyhase Motors. Already we are receiving hundreds of enquiries—indicating the great interest being worked up among motor buyers by our national advertising.

This interest will evolve itself into satisfaction as these motors are placed in service. The "ventilation" feature is supported by others equally as advantageous. Among them are high power factors, starting and maximum torques; absolutely-dust-proof bearings; reversible terminal box with removable cover.

Type "L" Motors are finding ready acceptance among motor buyers everywhere because of their downright ability to do their jobs faithfully and well. If you haven't already done so, it will pay you to get details of this profitable new line of motors by calling or writing us, today.

The introduction of Type "L" Motors is a forerunner of expanded R & M manufacturing and sales programs. Motor dealers are now afforded an opportunity to sell a complete line of R & M Motors.

Note: Below 15 H.P. the Type "K" will still be supplied. At present Type "L" is being built only in 15 to 150 H.P. sizes.

The Robbins & Myers Company of Canada, Limited

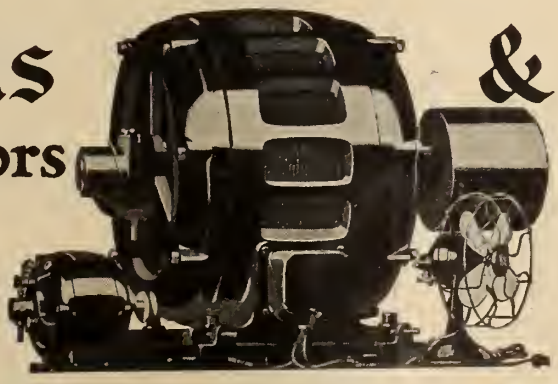
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Robbins & Myers
Motors *and Fans*



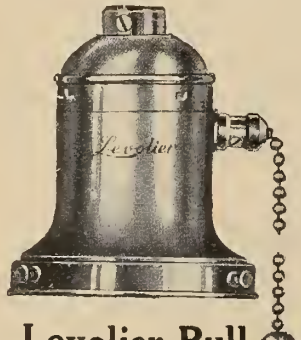
After September 15th



Levolier Pull Chain Socket 660 Watts

65250	⅛" cap
65251	⅜" cap
65252	Pendent cap
65253	⅛" angle cap

In cartons of 25. Standard Finish is Brushed Brass. Nickel, oxidized Copper and Bronze Finish extra.



Levolier Pull Chain Socket 660 Watts

2¼" Holder Type

65254	⅛" cap
65255	⅜" cap
65256	Pendent cap
65257	⅛" angle cap

In cartons of 25. Standard length of chain 8".



Levolier Lever Socket 660 Watts

65258	⅛" cap
65259	⅜" cap
65260	Pendent cap
65261	⅛" angle cap

Same mechanism as Pull Socket. Preferred to key and push sockets on portables because of neatness, longer life, and convenience.

Every Dealer and Contractor should place an order at once for Complete Assortment.

Toronto, July 23, 1923

To The Trade:

Re 660 Watt Pull-Chain Sockets.

Gentlemen:-

Owing to the fact that at the time the 660 watt socket ruling was put into effect it was difficult to obtain 660 watt sockets of the pull-chain type, therefore it was necessary for us, in many cases, to make exception to this rule and permit the use of 250 watt pull-chain sockets.

We have, however, recently been informed that the socket manufacturers of Canada are now prepared to supply the demand and fill all orders for 660 watt pull-chain sockets of an approved type.

You will, therefore, kindly take notice that after September 15th, next, the 660 watt socket ruling will be rigidly enforced and sockets of any type of a lower rating than 660 watts will not be accepted for installation in the Province of Ontario.

Yours very truly,

A. G. HALL,
Chief Electrical Inspector
Hydro-Electric Power Commission of Ontario.

All Pull Chain Sockets Used in Ontario Must Be

660 WATTS

CARRYING CAPACITY

THE Inspection Department of the Hydro Electric Power Commission of Ontario, in the above announcement published in the Electrical Trade Papers last month, made it clear that pull chain type sockets of less than 660 Watt rating will not be approved.

BANFIELD "LEVOLIER" SOCKETS, 660 WATT CAPACITY HAVE THE HYDRO APPROVAL. IT IS A TESTED SOCKET WHICH HAS BEEN PROVEN IN SERVICE—THE PIONEER 660 WATT PULL TYPE SOCKET IN CANADA—has a trouble-proof knife switch mechanism. They carry the extra load of small appliances safely. Lever is attached to interior —no loose chain to guide or adjust. Saves time in assembling. Chain can be removed without disturbing the shell. Approved by Fire Underwriters. Guaranteed by us.

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Orders for advertising should reach the office of publication not later than the 5th and 20th of the month.

Member Business Newspapers Association of Canada

Vol. 32 September 1, 1923 No. 17

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Large assortment of stock numbers ready for immediate shipment



Wall Bracket in Olympic Design, Flemish Gold Finish



Four-Light Dining Room Candle Fixture, Flemish Bronze Finish

Chesterfield Lamps
Table Lamps
Electric Fixtures
Commercial Units
Imported Electrical Glassware.

Illustrations show new designs in our latest catalogue.

Write for copy.



Cloisonne Finish, All-cast Candle Wall Bracket

NERLICH & CO.

146-148 Front St. W. TORONTO



Lighting fixtures must be on a par with the other furnishings

Making Hay When Sun Doesn't Shine

Illumination Sales Effort Will Reap Big Dividends in Coming Months of Decreased Daylight

Most branches of the electrical industry are now receiving the concentrated attention of skilful, enthusiastic salesmen.

Is this true of "Illumination?"

We believe it is true only in part. Here and there vigorous efforts are being put forth, and yielding excellent dividends. In the main however, the matter of lighting is being left to take care of itself. We hear of salesmen practising all sorts of clever stunts to find out what electrical appliances Mrs. Jones has, and has not got, but we don't hear that they even discuss with her the matter of whether she is getting the proper illumination effect in the various rooms in her home. Yet is it not well within the mark to say that ninety-five per cent. of the rooms in Canada's homes are not properly illuminated? They may have **enough light** but are they properly, tastefully, restfully **illuminated?**

And if this is true of houses, it is at least equally true of offices, factories, work shops and all kinds of schools, churches and so on. Did you ever try to make a list of all the properly illuminated buildings you could locate in your mind? Can you think of half a dozen that reach your ideal?

This all goes to show that the illumination of our buildings in general is **bad.** And it is bad because we have not made sufficient effort to correct it. It is bad because the general public does not realize that it is bad and does not understand the advantages of improving it.

The illumination field offers a bountiful harvest. The industry can now offer attractive and efficient fixtures to meet every conceivable condition and requirement. Lamps are available in great variety and are both efficient and dependable. The cost of current for operating the lighting system in any building is so small in comparison with other items of overhead as to be almost negligible.

The harvest season is approaching. October, November and December are the dark months. If you plan a campaign carefully you will surely find it profitable.

When Housewives See Good Lighting They Want it Themselves



The Only Thing That Holds Back Sales of Better Lighting Equipment is the Fact that Householders do not Realize Just What is Possible — Some Ideas for Building Residence Lighting Business

An ostrich cannot see much when its head is in the sand. Neither can the electrical man who gets buried in petty routine jobs. That is tne reason some of us regard the lighting field as a cut-and-dried proposition—we don't look around at the vast field of opportunity which spreads on every side where there are homes within reach of the power lines.

Take residence lighting alone. Only 675,000 Canadian homes are wired and there are 1,000,000 homes within reach of the power lines. That doesn't take into account at all the thousands of new ones being

(Name) (Address)

(Single 2-Family, or Apartment) (No. of Rooms)

	No. of Lamps	Type	Total Watts	Shades Reflectors	Recommendations
Kitchen					
Basement					
Dining Room					
Living Room					
Bedrooms No					
Bathrooms					
Porch					
Halls					
Pantry					
Closets					

Fig. 1—A form used by some dealers for canvassing purposes

built every year. We have a clear margin of over 300,000 to work on. This big surplus gives us a wonderful chance to sell "Better Lighting." Whenever a house owner has the least inclination to electricity, "electric lights" are what he wants first. It is up to us to sell him the right kind of installation.

First Steps in Selling Lighting

Let us suppose that you have decided to sell more and better lighting. The first step is to canvass your territory and find out what kind of equipment is on hand. The houses must be inspected and the results recorded on a form similar to that given in Fig. 1*. You will find that the housewives will become interested. The point is then to show them what Better Lighting will do. It is not within the scope of this article to give the material that you must have available, but a summary of it may be listed as follows:

(1) Start with basement and show what better lighting will do there.

(2) Work up through the house as your discretion directs you, in the same way pointing out how better light saves time and increases efficiency.

(3) Remember that a concrete demonstration is the only thing. There are plenty of little booklets available with catchy drawings. Show these to your prospective customer.

This is the sort of thing that opens the way to "Better Lighting" sales. It is the opening wedge, but it must be followed up. The following suggestions are picked from a follow-up plan that has been suggested by the Society for Electrical Development.

Following Up the Survey

1. Send follow-up letters to interest more householders in home surveys.
2. Canvass, to build up list of prospects.
3. Use window-displays to tie-in with the spirit of Better Residence Lighting.
4. Use the telephone, to strengthen mail and newspaper advertising.
5. Use newspaper advertising.
6. Give special lectures preferably illustrated by demonstrations, or a complete lecture course to salesmen, civic and business men's organizations, women's clubs, churches, schools and public institutions.



Fig. 2—A handsome living room in a Western city. It will be noted that the lighting of this room is entirely carried out by portables and wall brackets, a method which is growing in favor.

There are many other recommended plans such as the use of special publicity schemes or the use of banners on trucks and autos, and the supplying of items to the newspaper press. Other ideas include the staging of slogan and essay contests.

An important point is that all this outside effort must be tied in with window displays, and proper showroom arrangement. The telephone is a useful adjunct that should not be neglected. Use every lever you have to impress on your prospects that you are alive, know the game, and have something valuable to tell them.

When we figure on the absolute bare facts, which are, that many homes are not wired, and those that are wired are nearly all deficient in their equipment, we cannot fail to see that this end of the business is capable of development. It all rests, however, in showing the prospect, in a concrete way, what can be done with "Better Lighting."



Fig. 3—A small portable is an appreciated addition to the bedroom

Better Lighting in the Kitchen

Mr. Davis of the Consolidated Lamp & Glass Company says a wonderful change has come into the kitchen since so many hundreds of homes have installed the new Cora-Lite kitchen unit. The good wives who necessarily spend so much of their time there are noticeably more cheerful and happy. They work quicker and with less effort. There is bright untiring light all through the kitchen, and milady's eyes no longer look weary and strained. Baking in the oven or delving into the cupboard she finds plenty of illumination to handle her tasks.

Lighting the kitchen with this unit lightens the work and eliminates the eye-strain that makes drudgery. It floods the entire room with a bright light without shadows or glare. It chases the old gloomy shadows away. There is no reason why the home today cannot have a kitchen as adequately lighted as other workshops.

A Model Lighting Job



Loyal True Blue and Orange Home Is One of the Best Lighted Institutions in Canada — Recommendations of Illuminating Experts Followed Throughout with Splendid Results

Lighting jobs come in as many forms as do the pebbles on the sea shore. For all their variety, however, one seldom turns up which is considered 100 per cent. satisfactory from all angles. Hence it is a pleasure to describe what may be called a model job—one that all parties are thoroughly satisfied with. This job was done on the Loyal True Blue and Orange Home, north of Richmond Hill, Ont.

The installation was not extremely large but it was big enough to need careful planning. This cannot be better described than in the words of Mr. Hawkins 99 Adelaide W., Toronto, who is the man that supervised the fixture erection. At that time he was employed by Beattie McIntyre, Ltd., as was his present partner, M. B. Nelson. Here is what Mr. Hawkins says about the installation:

"All the glassware was sent out to us on the job. We used the centre of the basement as a distributing centre. Then we started to work from the top floor. There was no elevator there, you know. The job took four men about one week. One unpacked, one laid out and distributed, and the other two did the hanging. There was not one single breakage in the whole outfit of 284 fixtures.

"One thing about the job which greatly facilitated the work, was the fact that all fixtures were marked



Fig. 1—Type of fixture installed in foyer in main entrance.

by the maker as to place. That certainly helped us when it came to distributing. As they were unpacked they were checked and placed on the floor, at their point of location. The glassware was then laid alongside, and finally the lamps. The same order was followed in hanging them. That was a straight, go-ahead job, and a nice little job too."

Mr. H. S. Banfield, of W. H. Banfield & Sons, Ltd., has given us some very interesting information about the installation, from another point of view. He says in part:



Fig. 2—Main dining room using Imperial Design Bronze Pendant and Jefferson No. 550 glassware.

The greater number of features supplied were of the pendant type with 6 in. ventilated nitro holders.

On the first floor pendants equipped with Jefferson No. 550 glassware were installed in the office, waiting room, dispensary, sewing room, and the large class room in the south wing—where 18 units were placed, and the lighting effect in this room was excellent.

On the second floor pendants equipped with Jefferso No. 515 E-166 glassware were installed in the north and south wing dormitorys, main dormitory, nursery and sitting room. In the two dormitorys men-

tioned there were 10 units placed equipped with 100 nitrogen lamps, and with the attractively decorated Jefferson glassware of the type mentioned the effectiveness of the illumination was exceedingly good.

Fixtures of this type were also installed on the third floor in the girls and boys dormitory and the nurses bedrooms.

Pendants equipped with Jefferson No. 397 glassware were placed in the main and side corridors and stairways on all floors through the building, and this type of glassware with our Imperial design pendant in bronze finish was an excellent combination for the Grecian moulding and trim used in the corridors, and when illuminated the lighting effect was perfect.

Pendants in bronze finish of the Imperial design with tassel fittings were equipped with Jefferson No. 550 glassware and installed in the dining room on the first floor in the north wing. There were 10 pieces placed in this room and with 100 watt nitrogen lamps the lighting effect was very attractive.

Nickel-plated pendants with nitrogen holder and equipped with Jefferson No. 515 Cased glassware were installed throughout the hospital section on the third floor, comprising of two isolation wards, two convalescing wards, sterilizing room, two nurses rooms and the corridor; and with regard to the operating room nitrogen lamps of high wattage were used, producing a perfect flood of light so essential in an operating room.

Units of lesser importance from an illuminating standpoint were installed throughout the building in the kitchens, linen closets, toilets, girls and boys play-rooms, workshops, laundry, etc.—except in the girls and boys dormitory where 12 special units were placed in the ceiling (which is 12 ft. high) and fitted with Jefferson No. 4026 glassware and 10 watt nitrogen lamps enclosed in heavy hinged wire guards to prevent breakage.

In recognition of the excellent service which the Matron, Mrs. Crockett, has rendered the children of the Orphanage during her term of office, the Board of Directors of the Orphanage felt that fixtures of a special character should be installed in her suite, and in consequence a 4-light shower fixture finished in French bronze and fitted with decorated shades was installed in the living room, a 5-light oxidised silver shower constructed from heavy brass castings with frosted ball lamps was installed in the dining room, and a 5-light Butler's Silver Candle fixture was installed in the bedroom.

The Directors also gave special attention as regards the lighting equipment for the foyer and library. In the case of the foyer, four special fixtures were made and finished in bronze to accommodate Jefferson No. 403E-1 glassware, and with the ornamentation of these fixtures and the artistic design of the glassware they were very impressive pieces of lighting equipment. In the library there were four



Fig. 3—Left, lighting in girls' dormitory; right, side corridor, all floors.

special bowl hangers with bronze band and bronze straps and column and fitted with Jefferson No. 602E-137 18 in. glassware, three 75 watt lamps providing the illumination. The effect here was very good and added to the impressiveness of the foyer of the institution, as the library is visible from the main entrance.

And so throughout the whole institution lighting equipment of the very highest order was installed in every instance, even from the special library fixtures to the units in the laundry.

Diamond Fibre Exhibit at the Canadian National Exhibiton

The diamond State Fibre Company of Canada are planning a more extensive display at the Canadian National Exhibition in Toronto this year, as they found, last year, that great interest was taken in their exhibit, necessitating a more complete showing of their products. They will again be located in the Industrial Building (Booth 80A), and will show a full line of Diamond fibre and condensite celoron products, including celoron standard radio panels; they will also have an exhibit on the south-west section of the Machinery Building, where will be shown condensite celoron silent, waterproof gears and pinions in actual use, as well as other examples of fibre products in every day operation. Messrs. McFadden and Regan, representatives of the company for Ontario and Quebec respectively, will be in charge.

To win over a customer is more useful than putting over a sale.

Better Lighting of Streets and Highways Becoming an Absolute Necessity

Application of Improved Systems Has Not Kept Pace With Modern Traffic Demands—Equipment Developed for Any Condition

By R. M. LOVE*

The subject of street lighting is being constantly brought to the foreground at the present time, which is mainly due to the illumination in many of our cities and towns being inadequate to meet the demands of modern traffic. To appreciate this situation let us consider what we have passed through in the last six or seven years:—

(a) During the war street lighting suffered both in operation and development. The general unset-



Fig. 1—Sunnyside Boulevard, Toronto, by night. Lighted by bronze lanterns

tled conditions prevented any changes. The illuminating engineer was mostly engaged in research work for the government.

(b) The war over, the engineer was once again at work on new developments to meet modern demands. However, here in Canada municipalities were not in a position to consider their lighting problems and consequently the old antiquated lighting remained.

(c) We are now come to the time when it is becoming an absolute necessity for the cities and town to turn their attention to improving the illumination of their streets. New conditions are imposed upon us, which have changed our requirements entirely. The increased automobile traffic and the ever increasing growth of the moving picture industry are encouraging people out at night. The improvement of our highways makes driving a pleasure.

It, therefore, must be admitted that we have to increase the intensities of illumination to meet the modern demands, if it is nothing else but for a safety point of view. Here in Canada where power costs are low, with the present day developments and improvements in the art of outdoor lighting, we should lead all the other countries. Let us consider what we have today which will produce adequated street lighting at the minimum cost.

Ornamental Lighting

In the past the application of ornamental lighting has been confined to chiefly our "White Way" or main districts. We now have a trend for a much broader application which is extending our ornamental equipment to our parks, boulevards and residential districts. This has been brought about chiefly by the fact that we now have equipment to enable us to space out units a comparatively long distance apart by controlling the lighting, and confining it mostly to our road surface. This reduces the number of units required and incidentally reduces the capital cost.

We can also give some credit for this advancement to the development of the high candle power lamps eliminating the necessity of the three, four and five light cluster units and replacing them with the more stately single light unit. Today we are using incandescent lamps from 600 up to 2500 candle power for our business districts, and from 250 to 1000 candle power in our residential districts. For our downtown districts or "White Way" we still



Fig. 2—Sunnyside Boulevard, Toronto, in daylight, showing type of unit used.

*Street Lighting Specialist, C.G.E. Co., Toronto, Ont.

maintain a spacing from 80 to 125 feet apart at heights from 15 to 20 feet from road level to light center.

There have been a few cases where the mounting height has been increased to 25 and 30 feet, using 2 and 3 high candle power lamps, and spacing the units 150 to 200 feet apart. It is usually considered, however, that lower mounting heights and closer spacing is more desirable to get the real "White Way" effect which is enhanced by the architecture of the ornamental illuminares. The possibility of glare even

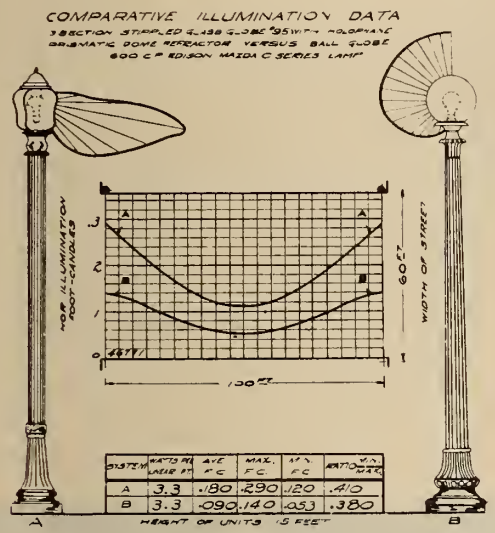


Fig. 3—Comparison of dome refractor with ball globe.

with the lower mounting height, which is argued by some, is not serious owing to the surrounding brightness of the show windows and buildings.

For ornamental lighting in our residential districts, boulevards and parkways we now have spacing as great as 200 feet, with mounting heights from 14 to 20 feet. Here is where we use a combination of prismatic glassware and an outdoor globe, which enables us to accomplish this wide spacing and still maintains an even distribution on our road surface.

The point is often brought up as to why we should use an outer globe; why not have the outer globe of prismatic glass and do away with the internal refractor? This has been done on a few installations but does not give the effect that is really required in street lighting. We also find a great tendency toward the opal globe. A great number contend that refractor distribution increases the intensity midway between lamps, and there is not sufficient light in the immediate vicinity of the lighting standard. The opal globe is not open to these objections in the same degree, but it is deficient in revealing obstacles or irregularities in the road surface midway between the units. In these dark regions pedestrians and vehicles proceed with difficulty and a feeling of insecurity.

The combination of a dome refractor and a rippled globe combines the advantage of both the opal globe and the complete prismatic top. Here we will get a higher intensity in the vicinity of the standard, and still maintain an even distribution to discern objects midway between lamps.

The type of globe referred to is one of the most interesting developments in street lighting glassware. The globe is made of a clear rippled glass which had minute ripples on the outer surface. For ornamental lighting this globe is given a thin flashing of opal so as it will have just enough diffusing qualities to reduce the glare to a minimum, and still maintain the direction of the light rays from the refractor. It also adds a pleasing sparkle to the light source giving appearance of life to the unit. In the cases where this glassware is used without refractors, it is usually given a heavier flashing of opal. We, therefore, see the ordinary opal diffusing globe is rapidly being superseded.

Within the last year or so there is still another pole top that seems to be coming very popular—the lantern type of illuminaire. This type is not altogether new, but perhaps an old idea being revived. Within the last year or so several lantern installations were put in. It embodies all the aesthetic points that can be desired, and it will show a big reduction in maintenance over the large one piece

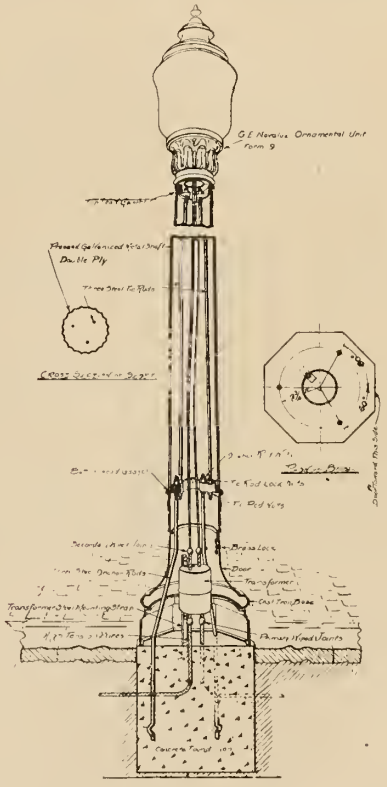


Fig. 4—Sectional view of steel standard, showing one method of mounting.

globe. Many designs have been on the market lately; one worthy of note is the Sunnyside installation, Toronto.

This is a lantern of cast bronze embodying glassware similar to the rippled globe. There is also the dome refractor used in this unit. We have a further

reduction in maintenance owing to the lantern being made of cast bronze, painting being eliminated. A 600 c.p. 20 ampere lamp is utilized; a series transformer buried in the ground by the side of each standard enables the use of the 20 ampere high efficiency lamp. The entire system is fed from pole type constant transformers which will be discussed later.

The standard utilized on this installation is also

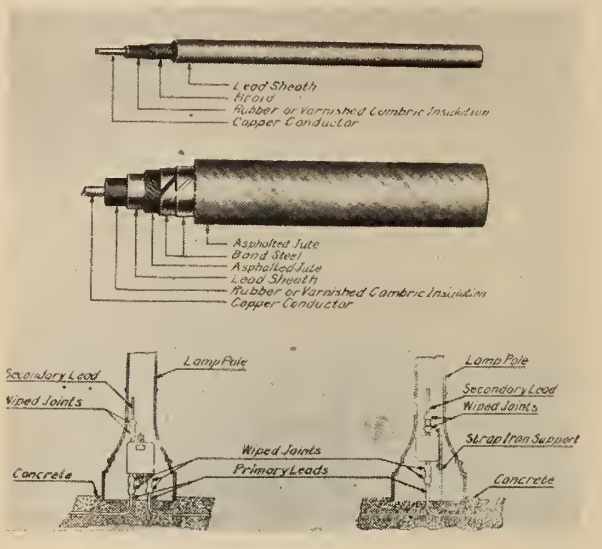


Fig. 5—Cable for use on series systems.

worthy of particular note. It is made of a cast iron base with a two ply copper bearing fluted steel shaft. The standard is held together by three tie rods bolted to the cast iron base, which is held by the anchor rods projecting from the cement foundation, and also bolted to the capitol of the lantern. With this type of standard, clean cut designs can be produced, and from a safety point of view it is considered far more advisable to use as compared with the heavy cast iron one piece standard which has accounted for a number of serious accidents, due to the heavy standard breaking off and falling when hit by a skidding car. The standard with the steel shaft will not break, but merely bends when hit by a vehicle. Due mainly to these facts, the steel standard is becoming universally used today superseding the heavy cast iron standard.

When we come to consider the feeder system for our street lighting units the tendency today is to the underground system. The first cost is, of course, somewhat higher than that of overhead, but this is compensated for by low maintenance.

The series system which is most common in this country adapts itself exceptionally well to underground work. The No. 8 cable, lead covered armoured with steel tape, is laid in a trench about 12 to 15 inches deep. At each standard it is customary to use a series transformer, which enables the use of the 20 ampere high efficiency lamp, also eliminating the series high voltage from coming above the ground. This is sometimes installed in base of standard. As an alternative, an auto transformer can be installed in the casing of the unit. The system can be fed from either the pole type constant current transformer operated by time switches, or the station type constant current transformer.

Suspension or Pendant Lighting

There is still a large field for the suspension unit either suspended on span wires over center of roadway or mounted on mast arms. In connection with this type of lighting our most important problem is that of proper glassware as in the ornamental lighting. Here we have a condition where we find that invariably the units are placed further apart than the ornamental. It is, therefore, of great importance to utilize glassware which will control your light.

The same argument can be put forth with regard to using prismatic glassware alone here as in the ornamental, only perhaps even more so. It is, therefore, suggested that the ideal arrangement is that of a rippled globe and dome refractor, giving a wide distribution and at the same time a high intensity underneath the unit enabling to see clearly by having a bright background. On this type of unit an auto transformer can be accommodated in the casing for utilizing the 20 ampere lamp. It also protects the lamp from surges due to lines getting crossed in a



Fig. 6—Left, rippled globe unit, with dome refractor; centre, auto-transformer in casing of unit; right, pendent unit with stippled globe.

storm. The unit can be suspended from an automatic cutout which will entirely sever the electrical connection when the lighting unit is lowered, at the same time short circuiting the line.

Highway Lighting

Highway lighting must be handled in an altogether different manner. We have an application different from all others when we are confronted with the lighting of our highways. We want to confine our light to the roadway only; we do not want to illuminate the neighboring fields. What we require to make the lighting of our miles of highways feasible is a unit which will accommodate a reasonably small lamp giving a wide distribution and enabling long

spacing; also at the same time giving a fairly high and even intensity on our road surface. This is necessary to meet the demands of modern motor traffic.

This is being accomplished by the nested parabolic unit which collects the light rays from a 250 candle power lamp and redirects them up and down the highway only. It is designed for a 250 c.p. lamp, and when mounted 30 to 35 feet above the road level can be spaced from 300 to 350 feet apart and maintains an even distribution. The result has become known as the "Ribbon of Light." With this type of lighting on our highways we reduce the glare of the automobile headlights. In fact it is quite possible to drive without headlights at all. The average automobile owner usually has only the evenings for pleasure driving during the week days, therefore the lighting of our highways is almost as important as our city streets.

At first it was considered by some that the glare of such a unit would be very objectionable, but this is not so, as the illuminating surface of the reflectors offsets the brightness of the lamp, and one sees the unit as he would a large diffusing globe.

Some of the advantages of highway lighting are as follows:

(1) Prevents accidents.
  (a) By showing up dangerous curves.
  (b) By reducing headlight glare.
  (c) By illuminating signs, sides of roads and obstacles.
(2) Adds to comfort of night driving.
  (a) By relieving eyestrain.
  (b) By assisting in making repairs.
  (c) By discouraging holdups.
(3) Increases night traffic thereby relieving day congestion.
(4) Decreases running time thereby increases road capacity.
(5) Helps to bring electricity to the farm by providing a pole line.
(6) Increases real estate values.
  (a) By tending to expand city along highway.
  (b) By extending electrical conveniences.

The benefits derived are many, and owing to the long spacing and small wattage consumption per lamp, the cost is low. Is there any good reason why, at least, our main highways should not be illuminated? The money would be well spent if it accomplished only one of the foregoing claims:—the prevention of accidents.

In conclusion, I would like to draw your attention to a point brought out in the report of the Street and Highway Division at the National Electric Light Association convention last year. Here was mentioned the fact that street lighting from the central station viewpoint is not always a desirable load. It involves a comparatively high investment and yields a relatively low income. It is seldom unattended by disagreement, suspicion and lack of appreciation o nthe part of the city officials. Yet, it represents the principle contribution of the utility to the well-being and safety of the community.

As a safety measure street lighting ranks with police and fire protection.

As a public improvement it ranks with sewage and paving.

As an expression of civic progress it is unequalled. Should a service of such high order be judged purely from a standpoint of investment and returns? It should be financially sound, but will it not yield its dividends in that untangible asset "Good Will?" It is a part of the entire investment which is not buried underground, or in a sub-station; it is the visible evidence of municipal electrical service.

Hemmings Falls Development

The contract for the construction work in connection with the development of one of the Southern Canada Power Company's power sites, located at Hemmings Falls, near Drummondville, Que., on the St. Francis River, has just been let to The Foundation Co. Limited, of Canada, and preliminary work will start at once.

The design and construction of the Hemmings Falls Development is in charge of Mr. J. S. H. Wurtele, plant manager of Southern Canada Power Company. The purchase of building materials will be looked after by the contractors. The purchase of machinery and equipment will be made through the purchasing department of Southern Canada Power Company.

At Hemmings Falls it is proposed to develop 30,000 horse power. This will be the second in a chain of six power developments of the Southern Canada Power Company, on the St. Francis River, having an estimated aggregate capacity of 150,000 horse power. Over half of the capacity of the Hemmings Falls plant has already been sold, and it is expected that the total capacity of the plant will be disposed of by the time the machinery is in operation, if the territory served by the company grows industrially at the rate it has in the past few months. It is proposed to develop the other sites as fast as the demand for power warrants it.

Catalogue and Folder on Sol-lux Illuminaires Issued by Westinghouse Company

A catalogue and an advertising folder, No. 4519-A, on its new Sol-Lux luminaire for commercial lighting have been issued by the Westinghouse Electric & Manufacturing Company.

Abundant Opportunity to Sell Better Store Lighting

Possibilities Have Been Proven—"More Business" the Clinching Argument —How to Pick Prospects

When one thinks of campaigns for selling store lighting, his mind at once drifts back to the successful effort that was put forth a short time ago by the Electric Service League of British Columbia. A full account of the campaign was given in the Electrical News at the time, so for the purposes of this article a summary will suffice:

The campaign consisted of:

1. Two multigraphed letters on League stationery sent to a selected list, one wek apart.
2. Letter No. 3 notified merchant that lighting salesman would call and endeavor to interest him in better illumination.
3. Personal call of salesman who, wherever possible, took measurements of the intensities, dimensions of the store or building, show windows, etc.
4. Preparation of layouts or plans by central station engineer. Unless special preference was indicated, prospect received calls from several contractors who supplied competitive bids.

The success of this campaign proved to be cumulative as it was determined that if one merchant installed a better lighting system which made his store dominate a block, other merchants on the same block instantly were interested in having the illumination of their stores brought up to an equal degree of efficiency.

Such a result is possible in any locality, because nowhere in Canada is all the store lighting, or even fifty per cent. of it, what it ought to be. A drive through any business street at night shows a condition of affairs that is almost unbelievable, when one considers that there are electrical dealers on every hand with opportunities of selling the proper equipment. Bare bulbs on drop cords are still the most common form of window illumination in many places. With these facts in mind, it is not difficult to decide on the proper time to start a store lighting campaign —NOW—is the time.

The Society for Electrical Development has



The window of a furniture store, with valance removed to show the lighting arrangements. This photograph was taken at night, entirely from the light furnished by the window itself.



An up-to-date shoe store, showing the arrangement of the interior lighting. The salesman who placed this installation convinced the merchant that it was good business to have all parts of his store equally well lighted.

brought out some good instructions for salesmen who go out after store lighting business. They are as follows:

Points for the Salesmen

The manner in which salesmen attempt to sell store lighting is important. The main thing is for the salesman to become thoroughly familiar with the merchant's point of view.

The sales presentation that wins is the one which convinces the merchant that better lighting will be profitable because it will help him sell. Nearly every merchant feels that this is true. Present to him the results of tests showing what effect better window lighting has in arresting attention—how for eight cents an hour, the merchant can stop 22 per cent. more people. Tell him that sales per customer have been increased 29 per cent. by improved store window lighting. Tell him what other merchants, who have well lighted stores, think about lighting.

If the salesman will carry a demonstration unit and use the sales tactics outlined above he should be successful. In addition, however, he should know how to quote illumination costs and the simple rules for the placing of units.

These may be stated briefly: For store interior lighting, dense white or prism glass enclosing units with 200 watt lamps on approximately ten foot centers. For window lighting a standard window lighting unit and 100 watt lamp to every running foot of window front.

Salesmen should be called into conference and thoroughly informed regarding the campaign. The getting together of prospect lists may well be made a part of the salesman's job.

Before salesmen begin to make follow-up calls, which should start immediately after the mailing of the first letter, they should be schooled on the proper way to sell and be given all information necessary to promptly quote costs to their prospects.

In every sales campaign, one of the first and perhaps the most vital step is the selection of the list of prospects. Unless the prospects selected are those among whom theer is genuine likelihood that sales can be made, there is bound to be much waste of selling effort.

There are a few well defined rules to follow in picking prospects.

1. Remember that this campaign centers entirely around store lighting. Do not confuse the issue and include factories or office buildings or other properties in the prospect list. In each case get the name of the owner or manager of the store.

2. Stores that are already fairly lighted are your best prospects. They will most readily buy better lighting.

3. All stores are prospects, but specialty stores, such as clothing, furniture, jewelry, books, etc., should be sold first as they are on the look-out for anything which will give them a merchandising advantage over their competitors and will consequently offer less sales resistance.

By a cumulative process the "stand patters," found in every business section, will come to see the value of, and necessity for, bringing their store lighting up to that stage of efficiency which is building business for their competitors and to their own loss. Large stores in big towns are not usually as good prospects as smaller stores simply for the reason that they are rather frequently called upon by lighting specialists.

4. Do not make your prospect list too large. It is better to concentrate upon a limited list than to spread selling effort too thinly, so include only those stores which you or your salesmen may hope to call on within a period of two months. If you have a large prospect list—too large to be called upon within two months—select the cream for your first campaign, then later repeat the campaign to a second list and so on until the whole list is entirely covered.

5. Sectionalize your list so that when portions are assigned to salesmen there will be no lost motion or overlapping of sales territory.



—Cut courtesy S. E. D.

6. It will pay to concentrate upon one type of lighting unit for store interiors and upon one type of unit for window lighting. For store interior illumination, choose some unit, preferably of white or prism glass, which entirely surrounds or encloses the lamp. It should be reasonably dust-proof, of pleasing lines and simple decorations. It should be as inexpensive as possible and yet should have a low light absorption factor. It should properly diffuse and direct the light. For store window illumination, also, select one type of standard window lighting equipment and stick to that.

Painting Helps Lighting

Some quite startling results have recently been obtained in office and factory work by giving a little extra attention to the color of solids upon which the light falls and from which it must be reflected to give a proper illumination. This applies not only to walls and ceilings but equally to the machinery and furniture. In a home it is not practicable to have all our furniture of a uniform color and indeed the function of light in the home is, in a large measure, decorative. In factories and workshops, however, it is different, and the painting of machines white or a light gray not only has a very marked effect on the general illumination but it also takes away that dingy atmosphere so common in industrial works. The brighter colors have another good effect too. They immediately show up any unclean spots and thus are of the greatest assistance to the management in their efforts for clean and sanitary conditions. There seems to be no doubt, further, that there is a phychological effect on the workers that tends to keep them happier and more contented in their work.

Development of Satisfactory Lamp Coloring Material

Lamp manufacturers have developed a coloring material for lamps which is very satisfactory. It is sprayed on the lamp, is weatherproof and does not fade. The sprayed color is even more uniform in color than natural colored glass bulbs which vary in color due to variation in density and thickness of individual bulbs. Sprayed colored lamps can be supplied more quickly than natural colored glass lamps, as the sprayed color can be quickly applied to clear lamps in stock, whereas the natural colored glass lamps usually have to be made to order and often bulbs have to be especially blown. Only four colors are supplied, which are a standard shade of red, blue, green and yellow. The sprayed colored lamp is no more expensive than dipped colored lamps and is cheaper than natural colored glass. The sprayed color can also be satisfactorily used on Madza C lamps up to and including the 150-watt size. Colored lamps are less efficient than clear or frosted lamps and should therefore be used only for decorative purposes.—N.E.L.A. Lamp Committee Report.

B. C. League Loses Chatfield

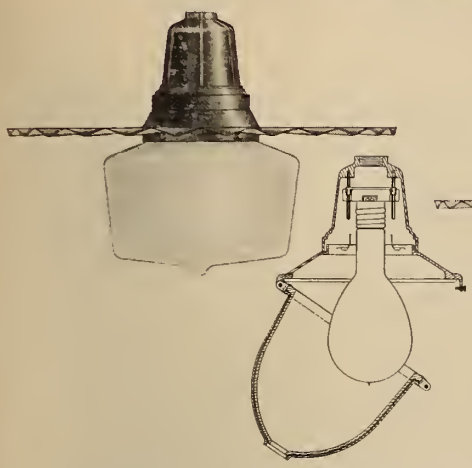
Rey E. Chatfield, for the past two years secretary-treasurer of the Electrical Service League of British Columbia, has resigned his position in Vancouver and is returning to San Francisco, California.

Mr. Chatfield is a graduate of the University of California with the class of 1914 where he took a course in the College of Commerce. His knowledge of cost acounting and merchandising, his executive ability, together with that indefiniable something called personality, so essential to one engaged in public service, proved him to be a very happy choice when it was necessary to obtain a fieldman to further the work of the League. During his brief stay Mr. Chatfield has accomplished much in improving conditions in the electrical industry and through his efforts League work in Vancouver has produced results that will be lasting.

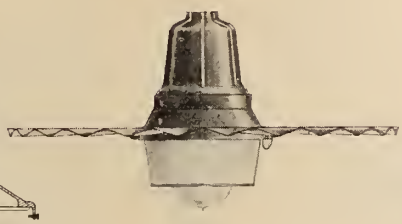
Having had eight years experience in the small store, four years of which time he was manager of two small stores, Mr. Chatfield came to the League wel equipped to carry on co-operative campaign work. As a result of his earnest endeavors a feeling of good will and a common understanding exists among the four branches of the industry and a very active machine has been established to carry on the activities to be followed up and undertaken.

The best wishes of the entire electrical industry in Vancouver go with Mr. Chatfield as he takes up new activities in his native country.

Up-to-the-Minute Accessories



A combination globe and reflector unit, having efficiency and distribution, by Winter Joyner Co., Ltd.

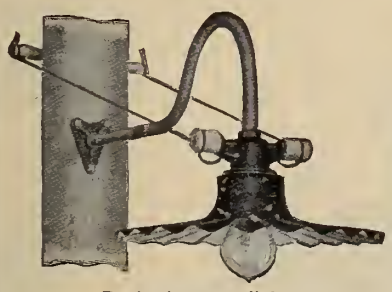




Benjamin R. L. M. Reflector



A street lighting unit, by Powerlite Devices, Ltd.



Benjamin street lighting unit, with Radial Wave Reflector



Benjamin Elliptical Angle Reflector



A street lighting unit, by Powerlite Devices, Ltd.



A dealer lamp display, evolved to help the sale of Westinghouse Mazda Lamps

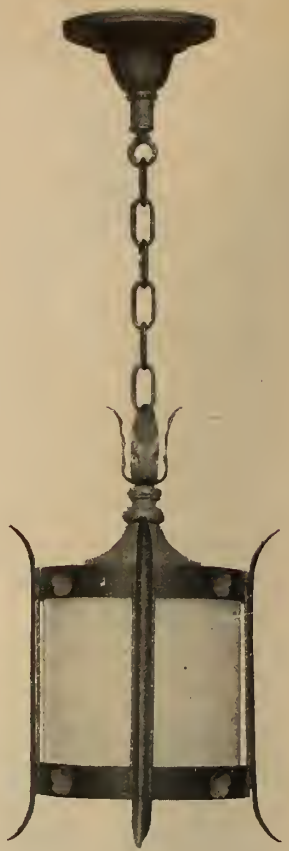
Artistic Lighting Fixtures



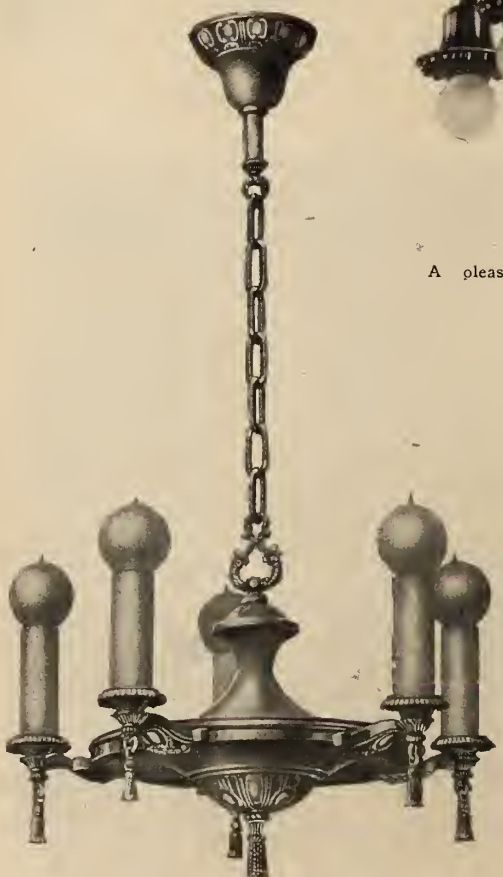
A favorite unit for school and commercial installations, by Tallman Brass & Metal, Ltd.



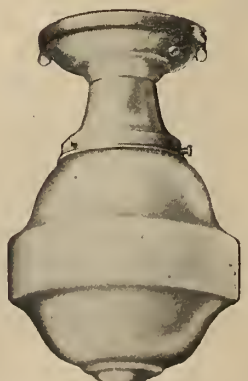
A pleasing design by the Crown Electrical Mfg. Co., Ltd.



A hall lantern, by J. H. Edmunds Co., Ltd.



One of the "3000" and "4000" line, by W. H. Banfield & Sons, Limited



An efficient kitchen unit, by Consolidated Lamp & Glass

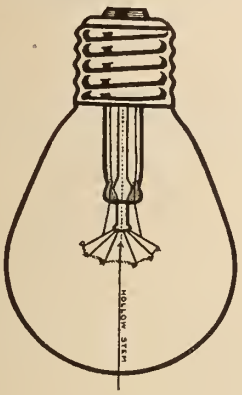


A candle type by Crown Electrical Mfg. Co., Ltd.

"Notice the Lighting Equipment"



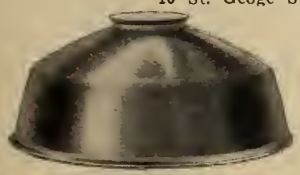
By Lightolier Mfg. Co. Limited,
40 St. Geoge St., Montreal



A small size "Holo-Stem" tipless lamp by Dalyte Electric Ltd.



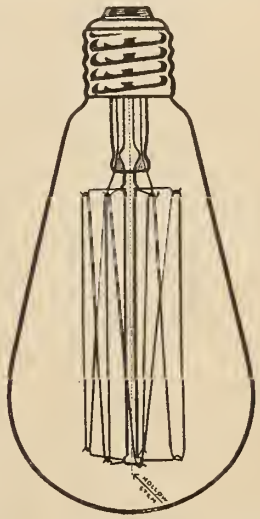
The Ivanhoe Ace—A commercial fixture by C. G. E. Co.



A commercial reflector, by
Canadian Westinghouse Co., Ltd.



A porcelain socket by
Smith & Stone, Ltd.



The Dalyte "Holo-Stem" tipless lamp, Dalyte Electric Ltd., Guelph



One of the Jefferson Glass Co.
550 Series

An artistic fixture being marketed by Nerlich & Co.

Toronto Licensing Bylaw Becomes Actual Fact

Takes Effect in October—Board of Examiners Appointed—Bond Must Be Furnished

Keen interest has been demonstrated in regard to the terms of the Toronto licensing by-law. As was mentioned in our last issue, this by-law does not go into effect until October 1. The full text of the act is printed below:

No. 137 A By-law

To provide for examining, licensing and regulating electrical workers.

The Board of Commissioners of Police of the City of Toronto enacts as follows:

1. In this By-law, unless the context otherwise requires

(a) "Board" shall mean the Board of Examiners appointed as hereinafter provided.

(b) "Contractor" shall mean and include any person, firm, company or corporation having a fixed place of business in the City of Toronto and performing or employing journeymen to perform the work of installing or maintaining wires, conduits, apparatus, fixtures or other appliances for the carrying or using of electricity for light, heat or power purposes within the meaning of this By-law.

(c) "Journeymen" shall mean any person who does any work in installing, repairing or making alterations to wires, conduits, apparatus, fixtures or other appliances for the carrying or using of electricity for light, heat or power purposes within the meaning of this By-law.

(d) "License" shall mean the certificate of qualification issued to a journeyman, company or contractor under the provisions of this By-law.

Must Be Licensed by October

2. Subject to Section 2 hereof, the provisions of this By-law shall apply to all contractors and journeymen engaged within the City of Toronto in the business of placing, installing, maintaining, repairing, replacing or inspecting in or on any class of structure, any conduits of any description, designed for the purpose of enclosing or carrying any electrical conductor for light, heat and power purposes upon which is impressed any electro-motive force equal to or higher than the voltage prescribed in the wiring regulations issued by the Hydro-electric Power Commission of Ontario, between any two conductors and ground independent of the characteristics of the current; of placing, installing, maintaining, repairing, replacing or inspecting in or on any such structures of any conductor, switch, attachment, fitting or any element whatsoever of any equipment designed for the purpose of supplying such electrical service, and every such contractor and journeyman shall obtain his proper license provided for in this By-law and shall not on or after October 1st, 1923, engage in any of the businesses or work referred to in the foregoing section without having obtained such license

Not Applicable to Public Utilities

3. The provisions of this By-law shall not apply to

(a) The class of work set forth in Section 2 located within power houses, sub-stations or other places wherein electrical power is generated or distributed by a public service corporation or by a municipal department and where such works are installed by employees under the direction of officers of such corporations or municipal departments, except in structures wherein the public, other than the employees of such corporations or municipal departments have free access on business.

(b) Such class of work on street railway cars or motors or on railway cars or lomomotives, the property of public service corporations or municipal departments where such work is installed by employees under the direction of such public service corporations or municipal departments.

(c) The insertion of lamps in sockets or receptacles or the replacement of such lamps, the carboning, trimming or operation of arc lamps, the lawful connection of utilization equipment by means of attachment plugs or the use or operation of the same or the lawful replacement of fuses controlling circuits or equipment.

(d) The erection, installation or maintenance of works and apparatus for telephone purposes.

Helpers Must Be Supervised

4. On or after October 1st, 1923, no apprentice or helper or other unlicensed person shall perform any electrical work or install any electrical material or appliances within the meaning of this By-law, except

as an assistant to or in the presence of any under the direct personal supervision of a journeyman continuously employed on the same contract or job and licensed under this By-law.

5. The Board of Commissioners of Police of the City of Toronto shall appoint a Board of Examiners consisting of four persons, one of whom shall be a qualified electrical contractor, one a qualified electrical journeyman, and one a representative of the District Inspection Department of the Hydro-electric Power Commission of Ontario, and the City Architect of Toronto.

Board of Examiners Determine Examination

6. The Board of Examiners may make Rules and Regulations for the examination of applicants for licenses under this By-law and as to the fees to be paid upon such examinations by the applicants, and as to all other matters necessary to the proper application of the provisions of this By-law, which Rules and Regulations shall be of no effect until approved of by the Board of Police Commissioners and shall on such approval be deemed part of and shall be read with this By-law.

Three Forms of License

7. Three forms of licenses may be issued under this By-law as follows:—

(a) A Journeyman Electrician License.

(b) A Company Electrician License, which may be granted to any Company, Association or Corporation doing or wishing to do business as a contractor for electrical installation, provided one of the members of such Company, Association or Corporation, or a regular employee thereof, having charge of such work, is duly licensed as a journeyman electrician.

(c) A Contractor's License.

Bond Must Be Furnished

8. Every contractor before obtaining a license shall file a bond with the City Treasurer in the penal sum of One Thousand Dollars, conditioned on the faithful performance of his duty as a licensed contractor and the faithful observance of the provisions of this By-law and any amendments from time to time made thereto.

9. Every license issued under this By-law shall be signed by the Chief Constable on behalf of the Board of Commissioners of Police and his signature may be lithographed or printed thereon.

10. Any contractor doing work under a license issued under this By-law shall post the permit issued by the Hydro-Electric Power Commission of Ontario in a conspicuous position outside the front of the building in which such work is being carried on and on the completion of such work must procure a certificate of inspection from the Hydro-electric Power Commission of Ontario.

11. Any person violating any of the provisions of this By-law shall forfeit and pay, at the discretion of the convicting magistrate, a penalty not exceeding (exclusive of costs) the sum of Fifty Dollars for each offence.

12. This By-law shall take effect on and after October 1st, 1923.

Convention of B. C. District Contractor-Dealers

Electragists from all of British Columbia gathered in Vancouver on July 27th, for the first purely Canadian Convention in that district, of electrical contractor-dealers.

A noonday luncheon in the Oval Room, Hotel Vancouver, formally opened the convention. This luncheon was held in connection with the Vancouver Electric Club of which W. W. Fraser, electrical contractor, is president. The luncheon was attended by the usual members of the Club and in addition by the members of the Advisory Council of the Electrical Service League and the Executive Committee of the Vancouver Association of Electragists, International.

An afternoon session followed the luncheon, over which Mr. C. C. Carter, Western Canadian Division member of the Executive Committee of the International Association, presided. Mr. O. C. Small of the Society for Electrical Development, delivered the first address on "Overcoming Sales Resistance against Electrical Appliance Sales." His talk was followed by an address by President Strong outlining the activities of the International Association, describing in particular the Eidlitz plan which has been adopted by the contractors in New York City.

An Electrify Club

In connection with the convention an Electrify Club contest was held to determine which members of the industry believed enough in the electrical industry to use the appliances and electrical conveniences they were selling in their business. Five members qualified for election to the Club. Mr. Percy Farr of the firm Farr, Robinson & Bird, won the contest but refused to accept the prize offered as he was a scrutineer for the Electrify Club committee, so that Mr. H. Pim, district manager for the Canadian General Electric Co., was awarded the first prize. The five members of the Electrify Club were P. F. Farr, of Farr, Robinson & Bird; H. Pim, Canadian General Electric Co.; Mr. F. J. Little, district manager, Northern Electric Co.; Bert Cope of Cope & Son, and Fred Cope of the same firm. This contest will be held annually hereafter and the rivalry for membership in the next contest is sure to be keen.

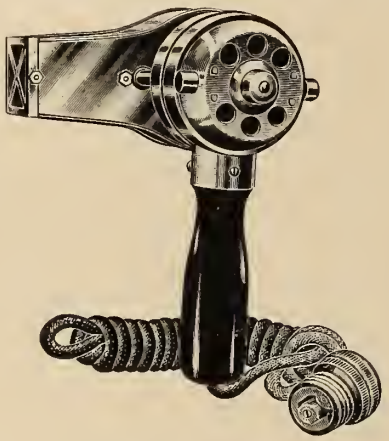
The convention was attended by over one hundred members of the electrical industry.

The Real Service Electric Co., Toronto, has been dissolved.

The Latest Developments in Electrical Equipment

Polar Cub Hair Dryer

The A. C. Gilbert-Menzies Co., Ltd., 439 West King Street, Toronto, are featuring an electrical hair dryer. This device is designed to remove the objection formerly advanced against hair dryers, namely, that they were too costly and bulky. The Polar Cub hair dryer weighs only 27 ounces and is claimed



to be very easy to use. It is equipped with an efficient type blower and heating element, and the handle is designed particularly to fit a woman's grip. The dryer is nickel plated and equipped with a universal motor which runs on either a.c. or d.c., 110 volts. Each dryer is packed in an attractive carton, and the equipment includes two-piece plug and special weave cord.

Sepco Electrically Heated Glue Pot

At 170° fifty per cent. of the viscosity of glue is lost in seven hours. Glue is sold according to its viscosity, the higher the viscosity, the higher being the price. Therefore, supposing one uses a 30 cent glue, if he heats it to 170°, it is no better than a 15 cent glue. Supposing he uses 50 lbs. a day, then his



loss is $7.50 per day. Under-heating is just as disastrous as over-heating, for tests have proven that the strength is also sacrificed in proportion the lower down the scale of the thermometer that you go.

For these reasons the automatic electric glue pot is a wonderfully efficient tool to have in the glue room. The Sepco pot, for example, is claimed to maintain indefinitely a temperature that varies less than 10° at an expenditure of less than 1 kilowatt an hour current per eight-hour working day. The economy of such a device can be measured in terms of time saving in the elimination of spoilage and in the maintenance of customer good-will.

The Sepco automatic electric glue pot is simple in construction. The workman turns on the switch and when the glue reaches the desired temperature, the automatic control turns off the current. It switches on or off according as the temperature drops or rises. In other words, the glue cannot over-heat. There are a number of other special construction features that also help to make the Sepco pot a most desirable appliance to have for all glue operations.

A New Electric Heater by Renfrew Electric Products

A new electric heater is being put on the market this fall by the Renfrew Electric Products, Limited, makers of the Majestic Heater. This newest Renfrew product is called the "Little Canadian Beauty" and has been brought out to meet the demand for an efficient, compact electric heater at a moderate price. The design is well-proportioned and the heater is finished in brown enamel. The heavy cast iron base gives the heater a steadiness that makes for safety no



matter where it may be placed. The full length (8 ft.) cord is fitted with removable plug for convenient attachment. A 600-watt capacity pin-in-type element is used, with solid porcelain element base and bronze terminals. The solid copper reflector is deeply concave, and in heating volume the new heater is rated equally with the single-coil Majestic. The reflector is pivoted, so that the heat can be thrown in any direction desired. Another appreciated feature is the removable guard, which makes dusting or cleaning easy.

H. B. Metcalfe has taken over the business of Metcalfe & Barnes, electrical contractors, Grimsby, Ont.

Whittle Patent "V" Belting

A mode of power transmission of unusual design is presented in the patented Whittle "V" leather belting.

This belting is not of universal application, but it has its own particular field. High speeds, with powers large or small, at short centres, is where it excels.

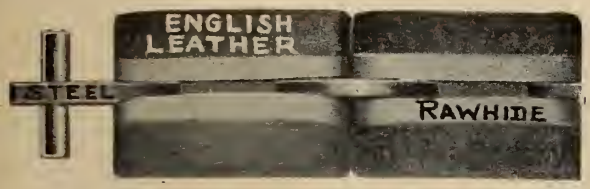


Fig. 1—Component parts of Whittle V Belting

Reference to figure (1) conveys at a glance the nature of its component parts.

Flexibility is secured by means of link formation, while the tension set up in transmitting the power is taken up wholly by the steel centre links, which rotate—or rather rock—in rawhide bearings. Engineers and all others familiar with mechanical methods, will readily recognize the durability of this simple combination.

The grip, or adhesion is obtained by the outer links which are made of best oak tanned leather, and are chamferred off to suit the "V" shaped grooves of the sheaves in which the belt runs. These leather links are held in place by ordinary wood screws. No stresses of any kind are taken up by these wood screws other than holding the leather in place, and as from the very nature of the drive the leathers are almost automatically secured by the sides of the sheaves themselves, the chief duty of these screws is



Fig. 3—5-H. P. "Whittle" Belt Drive in operation. Note curve caused by gripping power of belt. Motor pulley, 6 inches diameter. Motor speed, 1200 r.p.m. Belt, ¾ inch wide

to make the belt endless or to shorten or lengthen the belt as required.

The belt is made in a large number of sizes, ranging from ½ in. wide to 1¼ in. and it is stated that the latter size is very conservatively good for 20 h.p. when running at 4,000 feet per minute, and that in transmitting this power the centre distance between the driving and driven shaft may be so short that the two sheaves only just clear each other; on the other hand the centre distance may be as long as desired. The number of strands may be multiplied to suit the increasing powers exactly as in a rope drive. With a rope drive, however, it is not good practice to have the smaller sheaves less than 30 times the diameter of the rope, whereas with "V" leather belt, a diameter of six to seven times the width of the belt is suitable even for the most arduous duties.

The gripping power of this belt is exceptionally great (see Fig. 3) and as a consequence the efficiency is unusually high. Whether it is run tight or with several inches of slack the results are the same and this fact is demonstrated in multiple strand applica-



Fig. 4—Grinding manganese steel switches and frogs. A Whittle belt transmitting 10 h.p. over 7′ 6″ centres. The atmosphere is continually charged with metallic particles that flat belts last only about two weeks. At time photo was taken Whittle belt had been running 10 weeks with no sign of wear

tions where often as many as six or seven strands are each taking their share of the load yet all at different lengths.

All high speed applications come within the scope of this instrument of power transmission. Quarter twist drives (see Fig. 4); large reductions, often as great as 15 to 1, hot, dry, or moist locations; whilst

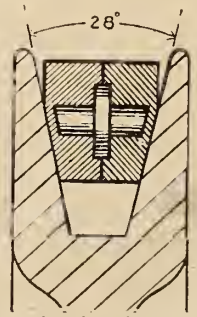


Fig. 5—Showing belt in groove of pulley

for cross belt drives the leather links are bevelled on both sides. It is claimed that there are many drives in Canada that have been in operation for 10 years without sign of any appreciable wear. Jones & Glassco Reg'd, of Montreal and Toronto, are the sole Canadian agents.

Current News and Notes

Bagotville, Que.

Contracts for the power plant equipment on the Riviere a Mars, at Bagotville, Que., have been awarded as follows: general contractor, Albert Fortin, Bagotville, at $125,000; wood stave pipe, Standard Wood Pipe Co., Williamsport, Pa.; turbine, S. Morgan Smith Co., 83 Craig W., Montreal; generator, Canadian General Electric Co., Ltd., 158 St. Antoine street, Montreal.

Brampton, Ont.

Belfountain, one of Peel's many beauty spots on the Credit River, is to be lighted by electricity, supplied by the Cataract Light and Power Co., the flat rate per house to be $15 per annum.

Brockville, Ont.

Definite promise of lower electric, gas and water rates before the close of the year was made on August 7 meeting of the Town Council, by Mayor Reynolds. He was satisfied, he said, that before October 1 the electrical rate for householders would be reduced 20 per cent., and there would also be reductions in the power and commercial rates for electricity and in gas and water rates.

Calgary, Alta.

Chief Engineer G. A. Gaherty, of the Calgary Power Co. and Montreal Engineering Co., announced that work will likely commence soon on the new $350,000 transmission line from Kananaskis and Bow River plants.

Cameron Falls, Ont.

It is stated that from 300 to 500 men will be employed from twelve to eighteen months on the work of placing the two new units at Cameron Falls, Ont.

Cobourg, Ont.

Campbellford town recently passed a resolution in favor of construction of an electric railway connecting Campbellford and Havelock with the lake-front district.

Fredericton, N. B.

Definite decision against the Provincial Government (through the New Brunswick Electric Power Commission) constructing a hydro line down the St. John river valley from a connection with Maine and New Brunswick Power Company's transmission line at Bridgewater, Maine, down as far as Woodstock, was announced here on Aug. 8 by Premier Veniot. Lack of a definite undertaking for consumption and quantity of electric current necessary to make the proposition a financially sound undertaking was given as the principal reason for the adverse decision. The Premier said that he did not doubt the market for the required amount of current was in the district that the line would serve, but it had not been lined up.

Gabelle Rapids, Que.

Construction work on the St. Maurice Power Company's plant at Gabelle Rapids is progressing rapidly, and it is understood that development is now eight weeks ahead of schedule. Nearly 1,500 men are engaged and it is expected that the first unit of 30,000 horsepower will be ready by the first of next May.

Galt, Ont.

Word has been received from the provincial Hydro-electric Commission by some of those who have signed contracts for the supply of power in the Lynden-Sheffield rural power district that instructions have been issued to the commission's construction department to proceed with the construction of this line. It will now be in order for those interested to proceed with the wiring of their premises. This new line will tap the sub-station at Lynden and will supply the villages of Troy and Sheffield and the farmers between these points. It will bring hydro within three miles of the village of Rockton and it is stated that residents there are much interested in securing service.

Hamilton, Ont.

At the annual convention of the Canadian Electrical Trades Union held recently in Hamilton, James T. Gunn retired from the presidency. D. C. Thompson, of the Dominion Power and Transmission Company was elected president.

Residents of Rosedale, at the east end of the city of Hamilton, in petitioning Barton Township Council for Hydro street lights stated that they got their Hydro power from Hamilton, the light from Barton, and paid their bills in Saltfleet. The lights will be installed on the local improvement plan.

Tenders are being called for the sub-station to be erected on Ottawa St., Hamilton, Ont.

Hemming's Falls, Que.

The Foundation Co., Ltd., 1511 St. Catherine W., Montreal, Que., are general contractors for the power development of the Southern Canada Power Company at Hemming's Falls.

Kirkland Lake, Ont.

An extra line is being built to the Kirkland Lake camp by the Northern Ontario Light and Power Company.

Lansdowne, Ont.

There is a great demand for electric power in

Lansdowne, Ont. Some residents are opposed to the cost of Hydro and propose that Lansdowne should install a small steam plant and generate enough electricity to light its homes and streets. Another suggestion is that John M. Campbell, Kingston, the owner of the power plant at Kingston Mills, should be asked to supply electricity to Lansdowne. For some time the place has used acetylene gas on the streets.

London, Ont.

The Radio station and supply store conducted by W. B. Folley at 143 Wellington street was destroyed by fire on Aug. 20. The loss is estimated at $3,000.

Meaford, Ont.

It is stated that negotiations are being carried out by the Ontario Hydro Commission for the purchase of the plant of the Georgian Bay Power and Milling Company, in Meaford, following the January vote of that municipality to adopt Hydro as opposed to a continuance of private power supply from the above company.

Montreal, Que.

Montreal Tramways Co. is preparing a map showing the area served by its lines, and all the routes, together with a series of numbers which will enable visitors and others to find the car they want readily. The system is expected to be put in operation on all lines by the end of the summer.

Nelson, B. C.

The city of Nelson, B.C., is to purchase a number of transformers and other equipment for the construction of the new power line which is being built to Balfour. On Aug. 8, the city council approved of the purchase on the recommendation of City Electrician G. T. MacGuire, who was authorized to arrange for buying this material at once so as to avoid any delay in the work.

Ottawa, Ont.

Radio enthusiasts in Ottawa received word of President's Harding's death at about the same time the news was received over the telegraph wires. Programmes being broadcasted from the American stations were discontinued out of respect for the late chief executive.

On Aug. 8 Eastview town council approved of the proposition advanced by the Ottawa Electric Railway Company to provide a street railway service for the town in return for a thirty-year franchise. The service will be started this fall.

Paisley, Ont.

On August 13, at Paisley, Ont., power was turned on over the new hydro electric extension from Chesley, by T. C. James of the Engineering staff of the Hydro-Electric Power Commission of Ontario. The affair was made the occasion of a general celebration. Among the speakers of the evening were Messrs. James and Fannery of the Hydro staff.

Paris, Ont.

To provide for the borrowing of $15,000 for the extension and improvement of the Paris, Ont., hydro-electric system, a bylaw on Aug. 8, passed three readings before the town council. Debentures will be issued at 5 1-2 per cent. and will cover the cost of certain work now being done to meet the increased demand for hydro-electric power.

Port Perry, Ont.

After many years of service, the old electric plant at Port Perry, Ont., was dismantled recently, simultaneously with the advent of Hydro, which will give adequate service to the village. Another improvement has been the acquirement of a new 100 horsepower gasoline engine, which will be used as an auxiliary for the electric water pump in case of fire.

Ridgetown, Ont.

On August 12, a much larger supply of power became available in Ridgetown, Ont., when three new transformers were connected.

Sherbrooke, Que.

The Westbury Basin power rights will be leased by public auction.

Toronto, Ont.

A public ownership conference will be held in the King Edward Hotel, Toronto, on September 10, 11, 12, and 13. Invitations are being issued by the Hydro Electric Power Commission of Ontario, the Public Ownership League of America, and affiliated bodies. A long program is proposed, beginning with an address of welcome by Mayor Maguire and ending with a tour of inspection of the Niagara Plants of the Ontario Hydro Electric Commission.

Announcement was made by the Toronto Harbor Commissioners on Aug. 13, that all the Hydro towers along Sunnyside from the Exhibition grounds to the Humber will be removed this fall to a new location to the north, at an estimated cost of $75,000. The work will be started early as it is felt that no time should be lost in preparing to take care of the extra 110,000 horsepower soon to come from the Chippewa development.

Vancouver, B. C.

With appropriations set aside for hydro electric power development, track construction, line construction, light and power extensions, etc., approximating $12,500,000, over $700,000 of which will be spent in Vancouver alone this summer, and a great deal of which has been and is already being expended, B. C. Electric Railway officials are facing one of the busiest periods in the history of that corporation. They are doing their part in preparing for the Vancouver that students of present conditions say will become a city of over a million people in ten years' time.

Victoria, B. C.

In accordance with the policy of the Pacific Cable Board to duplicate the cable system linking Canada,

Australia and New Zealand by way of Fanning and Norfolk Islands, work has been commenced on the section from Sydney to Southport, Queensland.

Wapella, Sask.

The ratepayers of Wapella, Sask., recently passed a by-law authorizing the council to sell debentures for taking over the electric lighting system and erecting a powerhouse.

Weston, Ont.

Farmers in the Downsview district are enthusiastic about electric power. One user states that his electric bill is only $70.00 per year for light and power. The greatest expense incurred in running a farm by electricity, he claimed, was that in providing power to pump water.

Windsor, Ont.

Work on the proposed ornamental lights on Wyandotte street, from Argyle road, Walkerville, Ont., has been commenced.

Winnipeg, Man.

"Manitoba is coveting nothing that belongs to Minnesota or Ontario, but is simply desirous of using the waterpower which is available," declared Hon. Thomas H. Johnson, K. C., addressing the Winnipeg Kiwanians recently. The Ontario government viewed Manitoba's claims as just, he said, and he expected an amicable settlement of the difficulties. Within the next quarter of a century, the whole of the potential water power of the river, which, when regulated, would produce 500,000 horsepower, would be in use in this province, if the demand for electricity continued as at present.

Woodbridge, Ont.

An interesting item appears in a local paper, dealing with the recent fire in the Woodbridge, Ont., substation:

"The local fire brigade rushed to the station immediately after the building was struck, but were afraid to play the hose on the burning wires because of the serious damage that might result to the electrical apparatus. All wires and connections were burned completely off and it looked at first as if the transformers were badly damaged. There was considerable surprise when the lights went on again before midnight."

Woodstock, N. B.

A report states that, failing a government line, the Woodstock N. B., Power Company will erect their own line connecting with the Aroostock line.

Geo. Broughton Represents Paine Company

The Paine Co. of Canada in charge of Mr. Geo. H. Broughton, 122 Wellington St. W., Toronto, now carries a stock of toggles, expansion shells, and outlet box hangers which are manufactured in Canada under Canadian patents, and will be pleased to furnish samples to those interested upon request.

Wiring Contracts Awarded

Baden, Ont.

C. Laderman, $8,000 house.

Caledonia, Ont.

Fred Avery, $2,000 house; $5,000 house.

Hamilton, Ont.

Alb. H. Schwenger, apartment house on Main St. E.

Electric Supply Co., Ltd., alterations and addition to high school, $56,480.

London, Ont.

Knowles Electric Co., $100,000 apartment on Queens avenue.

Long Branch, Ont.

J. McNeiod, $5,000 residence.

Leamington, Ont.

A. E. Law, $4,000 residence on Robinson street.

Angus C. Fox, $14,000 store block.

Montreal, Que.

Acme Electric Co., $15,000 repair shop, 57 Osbourn St.

D. F. Shelley, $3,000 house on Gilford street.

Mr. Creamer, 1233 St. Lawrence, $5,000 garage and house at 1225 St. Lawrence Blvd.

R. Gingras, $9,000 house on Dante St.

W. Cousineau, $12,000 house on Girouard.

S. Quesnel, $9,000 house on Earnscliffe Ave.; 2 houses $25,000 on Notre Dame St. E.

J. Levesque, $4,000 residence near 3252 Henri Julien.

J. A. St. Amour, $65,000 house on Blvd. Decarie; $30,000 vault on Legauchetier; $8,000 house on Garnier St.; Hohe "House for Religious" $37,000.

L. Dansereau, $25,000 store and flats on Demontigny; $60,000 Labor temple.

Vincent & Say Elec. Co., $35,000 church; $25,000 molasses distillery 1706 Notre Dame St.

A. Boisenu, $10,000 house on Christophe Colomb; $10,000 house on Boyer St.

Chas. Laurin, $7,000 house on St. Denis.

J. S. Drummond, $9,000 house on West Broadway.

Omer Langevin, 3 flats, $7,000, on St. Denis.

J. O. Deschesne, stores and flats on Sherbrooke St., $16,000.

R. S. Muir, repairs to residence, $9,000 at 48 St. Matthew St.

W. Rochon, Parish St. Pierre Claver school.

A. Leduc, $6,000 house corner Notre Dame and Lepailleur streets.

N. Lallier, $6,000 house on St. Andre.

E. Mongrain, 3 houses, $14,000 on St. Antoine St.

O. Tardif, $40,000 presbytery; 2 residences on 5th Ave., $16,000.

J. X. Guay, 2 residences on Chamblay St., $22,000.

R. Talbot, $9,000 house next to 2655 Christophe Colomb.

Mr. Lafreniere, 9th Ave. Ros., $10,000 house on Bourbonniere St.

O. Labelle, $11,000 house on Voluntaire St.; 4 residences on Marlow Ave., $30,000.

J. H. Lamarre, $8,000 house on Laurier Ave.

Charrette & Freres, $25,000 residence and tenements, corner Roy, St. Andre & St. Christophe Sts.

W. Cousineau, $6000 house next 18 Melrose Ave.

A. Roy, $6,000 house on Galt Ave.

G. Meloche, $5,000 house on St. Dominique St.

New Hamburg, Ont.

Geo. Morley, $5,000 house on Huron St.; $7,000 business block.

New Waterford, Ont.

Jack Donovan, $7,000 hospital on Plummer Ave.

Ottawa, Ont.

Geo. Thompson, $9,000 house on Gilmour St.

J. Ellacott, $4,800 house; $7,000 house on Sunset Blvd.; $5,000 house on Java St.; $5,000 house on Bellwood Ave.; $5,000 garage on Gilmour St.

Norman Young, $4,000 house on Caroline Ave.; $6,000 house on Powell Ave.; $9,000 house on Clemow Ave.

J. Saunders, $4,000 house on Caroline Ave.

J. E. Cherry, $4,000 double house on Ossington Ave.

Marchand Electric Co., $25,000 apartments on Somerset St.

Oshawa, Ont.

Clarence Deguerre, $5,000 house on Park Rd.; 10 residences, $4,000 each, on Clark St.

Purdy Bros., 10 residences, $3,000 each, on Arthur Street.

W. A. Bradley, $4,500 house on Golf St.

Outremont, Que.

Hayes & Lebreton, $24,000 cottage on Holyrood Ave.

E. Choquette, $25,000 house on Dollard Ave.

D. A. Beaulieu, residence, flats and garage $35,000, corner Outremont and Dureger Avenues.

R. S. Muir, 4 houses on Willowdale Ave., $24,000.

Canadian Duplexalite Co., Ltd., $10,000 house on Elmwood Ave.; cottage on Maplewood Ave.

J. A. Roy, $12,000 cottage on Hartland Ave.

J. A. St. Amour, $66,000 school "Lajoie."

Peterboro, Ont.

Miller, Powell & Watson, Salvation Army Temple $28,000.

Quebec, Que.

P. P. Giguere Cie. Ltee., $75,000 Refuge on Ste. Foye Road; $14,000 house on St. Cyrille St.

St. Catharines, Ont.

J. Dessard, $5,000 house on Highland Ave., Port Dalhousie, Ont.

J. H. McLaren, $3,500 house corner York & Pleasant Sts.

H. C. Holmes, stores and flats at 223 St. Paul St.; $6,000 house at 61 Ontario St.

A. B. Cudney, $4,500 house.

Sandwich, Ont.

C. Usher, $4,000 house on Rankin Blvd.

Saulte Ste. Marie, Ont.

Taylor Bros., $6,000 house on Albert St.

Rapid Electric Co., $5,000 house on Simpson St.

Sydney, N. S.

Ed. D. Murphy, $45,000 Nurses' Home.

Terrebonne, Que.

S. Quesnel, $6,000 house corner St. Joseph & St. Jean Baptiste St.

Toronto, Ont.

Leslie Electric Co., $95,000 addition to Runnymede school.

G. Armstrong, $5,500 house, Brookside Ave.; 2 residences $4,500 each, 334-6 Willard avenue.

Roxborough-Dean Ltd., $20,000 residence on Woodlawn Ave.

Leo Snow, store and apartment north west corner Bloor and Dorval Rd., $18,000; 2 residences 107-9 Armadale Ave.

C. M. Stevens, pair residences $24,000, south side 4th Ave.

J. Ritchie, $8,500 house on Willard Ave.

S. Johnston, pair residences west side Cannon near Gerrard E., $8,000.

Taylor Bros., $4,000 house east side Chisholm near Newmarket Ave.; $5,000 detached bungalow west side Meagher Ave.; pair residences east side Lawlor Ave., $8,000.

R. Seaton, $7,500 house Armadale Ave. near Ardagh.

Geo. Coulson, $4,500 house east Meagher near Newmarket.

Vancouver, B. C.

J. C. Reston, addition to store, 556 Granville St.

Westmount, Que.

W. E. Booth, $22,000 house and garage, east side Grosvenor Ave. below Cote Road.

H. R. Cassidy, 4 semi-detached houses on Thornhill Ave.

Wolfville, N. S.

J. C. Mitchell, $9,000 house on Summer St.

Windsor, Ont.

David Moore, $3,500 house on Elsmere Ave.

F. D. Reaume, $5,000 house on Parent Blvd.

C. Usher, $6,000 house on Cameron Ave.

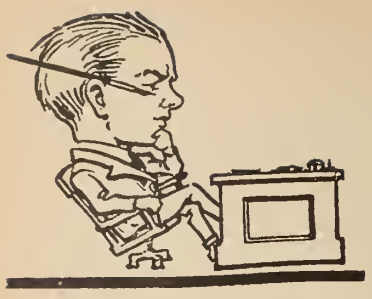
Winnipeg, Man.

Union Electric Co., 7 stores $22,000, north west corner Portage and Beverley Sts.

Star Electric Co., $13,000 apartment block, Dorchester, west of Aynsley apartments.

York Twp., Ont.

Roxborough & Dean, Toronto, Ont., addition to "John R. Wilcox" school, $30,000.



The Editor Comments

Unsanctioned Diversion of Canadian Water

Is the Sanitary District of Chicago diverting from eight thousand to ten thousand cubic feet per second from the Great Lakes? This is the charge recently made by Sir Adam Beck. He states that the Sanitary District has the sanction of the United States Government to divert 4167 c.f.s. but that Canadian consent was never given, even for this amount.

What is the difference between taking water from an international source for domestic use and taking it, for example, for hydro-electric purposes? Yet the United States has always respected her agreement with Canada regarding the use of the Niagara River for power development. Any other policy would, of course, be termed "unfriendly." In what way does the water diversion to Chicago differ? Putting the most favorable interpretation on it, the use of this water without Canada's consent is an over-aggressive policy and what, in private life, would be termed "cheeky." To take more even than that allowed by the home government differs only in degree, and is merely a more flagrant violation of the law of good sportsmanship. That Canada has borne this almost-insult in the past is no doubt due to her desire to live at peace with her neighbor, with which is coupled that hereditary element of sportsmanship that leaves it to the umpire to say when the opponent is playing a dirty game. In the absence of an umpire, however, it is doubtful if any moral code requires that we should sit by and watch our neighbors coolly appropriate to their own use a natural resource that belongs to us as much as to them. It seems to be about due for our government to stop taking things for granted and do a little plain speaking.

At Last, a Licensing By-law

The insertion in this issue of the text of a by-law providing for examining, licensing, and regulating electrical workers in Toronto, is the public announcement of the final success which has crowned the efforts of a devoted band of workers in the local contractor-dealers' association of that city. This happy outcome, the end of work which has been actively prosecuted for months, is of keen interest to other than those electrical contractor-dealers resident in Toronto. The success of the by-law in that city will undoubtedly lead to the adoption of similar measures in other places.

Toronto contractor-dealers are naturally very much pleased with the measure, with only here and there a dissenter, or perhaps more correctly, a pessimist. It is pointed out that the by-law leaves many matters still to be determined, and that upon the successful solution of these matters depends, in a measure, the future success of the by-law. There does not seem, however, to be the least doubt of the fact that the by-law will eliminate faulty workmanship, and in various ways raise the standard of the trade.

The successful progress of this matter is a strong testimony to the value of association work, and to the energy of the men who saw it through.

An Argument for Better Illumination

The salesman of illumination, especially factory illumination, is always alert for arguments to convince his prospect of the value of better lighting as an investment. Mr. Sam Hibben of Westinghouse fame, who is widely known for his lectures on various phases of illumination, makes a strong argument of the "speed of vision." Mr. Hibben points out that the action of the eye is very similar to that of a camera in taking pictures. On a bright day, with good illumination, "instantaneous" snaps of the order of one-hundredth of a second are the regular practice. If the day is cloudy this period may be extended to a "time" exposure of a full second or more. Interior exposures may take several minutes.

Now, the action of the human eye is much like taking a series of pictures. The eye takes millions of pictures daily and records them on the retina. If the light is bad and the operation of taking the picture is prolonged it is easy to see that a workman is forced to slow up. The total loss in the quantity of work carried through in a day is not easy to calculate but it would evidently be very considerable and may well pay, in a very short time, for the total cost of a better system of illumination.

Another point brought out by Mr. Hibben is the extreme variation in light intensities at various points of buildings that are apparently very well provided with daylight. Take the ideal case of a factory with unobstructed daylight on both sides. In one such case examined, the intensity was 60, close to the windows on each side, but dropped to 10 in the centre of

the building. Yet to the general observer the illumination looked uniform and ample.

Another point brought out was the much higher intensities under which it is now found that workmen can do more efficient work. It was formerly feared that anything over 5 to 10 foot candles would cause eye strain. Now values of 20 to 50 are not uncommon. This of course is still very far below good daylight value but is made possible by developments in the art of lamp manufacture by which we are constantly getting an effect that more nearly approaches true daylight.

Our Growing National Exhibition

Year by year in the forty-four years of its existence the Canadian National Exhibition has grown with consistent regularity until it has attained the distinction of being the greatest annual fair in the world. In point of attendance alone, Toronto's great exhibition leaves all others far behind. Last year, for example, 1,372,500 people passed through the gates—visitors from all parts of the continent and from overseas. The daily average attendance of 106,000 was double that of any of the state fairs of the United States and a record unsurpassed by any world's fair of the past in the same number of consecutive days.

In the character of the displays, however, the Canadian National Exhibition shows an even greater measure of superiority. The resources of Canada, natural and manufactured—indeed, the resources of many other countries—are gathered together and housed in over four score permanent buildings, representing an investment of $11,000,000. This year the Exhibition takes on a new and broader aspect. With exhibits from several foreign countries endorsed by their respective governments, it becomes virtually a world's fair. Plans which are under consideration at the moment anticipate the development of this idea, so that ultimately the Canadian National Exhibition may become truly a permanent annual world's fair.

For the electrical man the C.N.E. is a veritable storehouse of knowledge and information. Almost in no other way is it possible to see within small compass so great an array of engineering and construction materials and equipment. These are presented in a manner that will attract the attention of those interested in them and will give an idea of their value and serviceability that cannot be obtained by viewing them in shop or office.

Street Lamps for St. John, N. B.

A total of three hundred 250 candle power street lamps will be located in West St. John, N.B., for street lighting purposes. The distribution system is now being erected.

Summer Course for Teachers of Electrical Engineering

Leading educators of scientific schools are spending five weeks of their summer vacation studying electrical equipment production facts at the East Pittsburgh and South Philadelphia Works of Westinghouse Electric & Manufacturing Company. The object of the conference is to bring the various participants as closely in touch with the latest production methods which gives them a broader viewpoint of industry in general so that they may be better fitted for teaching their respective subjects. Each professor may specialize in some particular activity of his own choice, either design, application, production or test. At the same time the group participates in a daily conference with one of the departmental heads. The conference program is very broad bringing to the teachers the experiences of specialists on all phases of electrical, steam and auxiliary equipment.

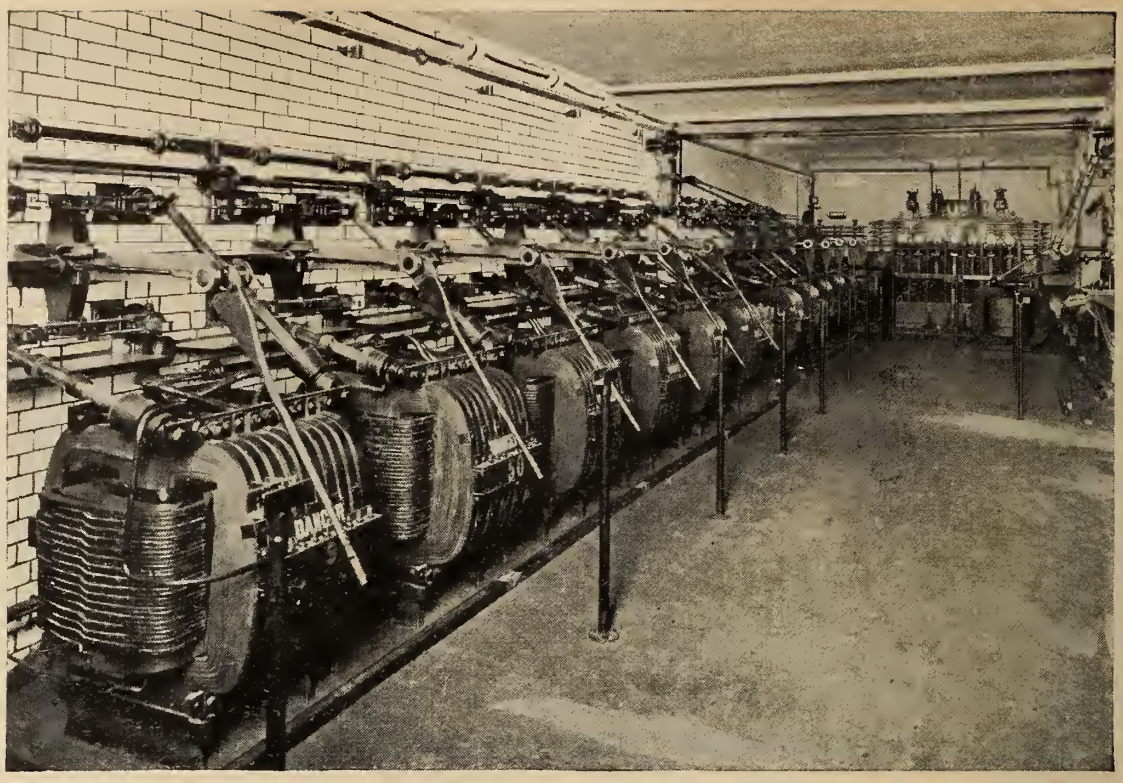
Among the members of the conference specializing in various phases of electrical equipment is Professor H. W. Price, whose name needs no recalling to School grads. No doubt he will come back with a few design ideas that will make some of the budding engineers wish he had foregone the trip.

Electric Companies Pool Radio Patents

It is announced that a group of electrical companies in Canada have agreed to pool their wireless patents for the common good. Under the agreement each of the companies agrees to license all the other companies within their natural field. The companies agreeing to the arrangement are the Canadian General Electric Co.; the Marconi Wireless Co. of Canada; The Canadian Westinghouse Co.; the Bell Telephone Co. of Canada; the Northern Electric Co., and the International Western Electric Co. Under the agreement the Marconi Co. will have access to all wireless patents, the Bell Telephone Co. to all telephone patents, etc. The agreement is for the life of all existing patents and also covers future patents or applications for patents.

Lamp Sales Per Head of Population

Worked out mathematically from statistics gathered over a series of years, the lamp sales of this continent average two per year per head of population. Canada, being farther north, uses more hours of artificial light and naturally would require rather more than this average figure. However, using this as a basis, any contractor can look over his constituency, count the heads, multiply by two, and in that way find out if he is getting his fair share of lamp business.



10,000 volt Ferranti transformers supplied in 1892 fo Deptford Station and still in use. Photo taken in 1922

Extension by Ferranti Company Will Double Present Output

Present Strength of Organization Due to Close Connection With Parent Company, which is Entirely English

It is always a pleasure to comment on the growth and expansion of any Canadian manufacturing enterprise, especially of companies having their foundation and association under the British flag. Work is now under way on an extension of the Toronto factory of the Ferranti Meter and Transformer Manufacturing Company on Noble Street. The enlarged premises will provide for more than double the present output and the improved facilities which will be available will enable the company to manufacture power transformers up to approximately 750 kv.a. capacity. The defined policy of the Ferranti company to strengthen its Canadian manufacturing organization has promise of assured success as shown in the record of the past year. Domestic business has increased more than one hundred per cent. over the previous year and, in addition, orders have been filled for approximately two hundred three-phase transformers for export to New Zealand.

The Canadian company is very fortunate in its connection with the parent Company, Ferranti Limited of Hollinwood, England. Throughout England the name Ferranti is closely linked with the development of electrical science and industry, and particularly with the invention and early development of the house meter. The company was founded by Dr. S. Z. de Ferranti, an Englishman, descended from four nationalities, for his four grandparents were English, American, French and Italian respectively. He became interested in electricity and electrical apparatus in his school days and at a very early age had designed and invented dynamos, transformers, meters and other machinery. As a result of his early inventions he became associated with Sir William Thompson, later Lord Kelvin, and in conjunction with him produced an electrical alternator which was far in advance o fany apparatus of the kind that had been produced before. He decided at this stage to commercialize his inventions and with this end in view, workshops were opened in Appold Street, Finsbury, E. C.

This was the beginning of Ferranti Limited. The business rapidly outgrew the original premises and was moved to 576 Hatton Garden E. C. where he gathered round him a staff of young engineers, many of whom have since become famous in the electrical world. Subsequently the concern had to take still larger premises and was moved to Charterhouse Square E. C. These premises in turn became too small and a final move was made to Hollinwood, about four miles from Manchester.

Pioneer Mercury Meter

In 1883, Dr. Ferranti invented the pioneer mercury motor meter. It is typical of the working of an

inventive mind to note that he was then superintending the running of a Siemens electric crucible furnace. He found that the furnace arc always concentrated in one place and developed excessive spot temperatures, so he put a coil around the crucible, passed an electric direct current through this coil and thus caused the arc to rotate, giving even distribution over the surface. But he noticed that when it became fluid the metal also began to rotate and the question at once arose in his mind—how could this phenomenon be put to practical use? Exhaustive experiments were undertaken, with the result that mercury was substituted for the molten metal and a successful mercury meter was produced. From that day on mercury meters have been in general use throughout the world for the measurement of direct current electrical consumption.

In 1886 Dr. Ferranti was in charge of the Grosvenor Gallery Station, the first station to give a public supply. In those days the people who undertook to give a supply of electricity often had to manufacture the machines with which to generate and control it; finding that transformers were needed, Dr. Ferranti set to make them at his Hatton Garden Works. Later, as chief engineer of the famous Deptford Station, he had to make not only generators and transformers but also the insulated conductors for transmitting the electricity to the sub-stations and supply points.

An Early Advocate of Alternating Current

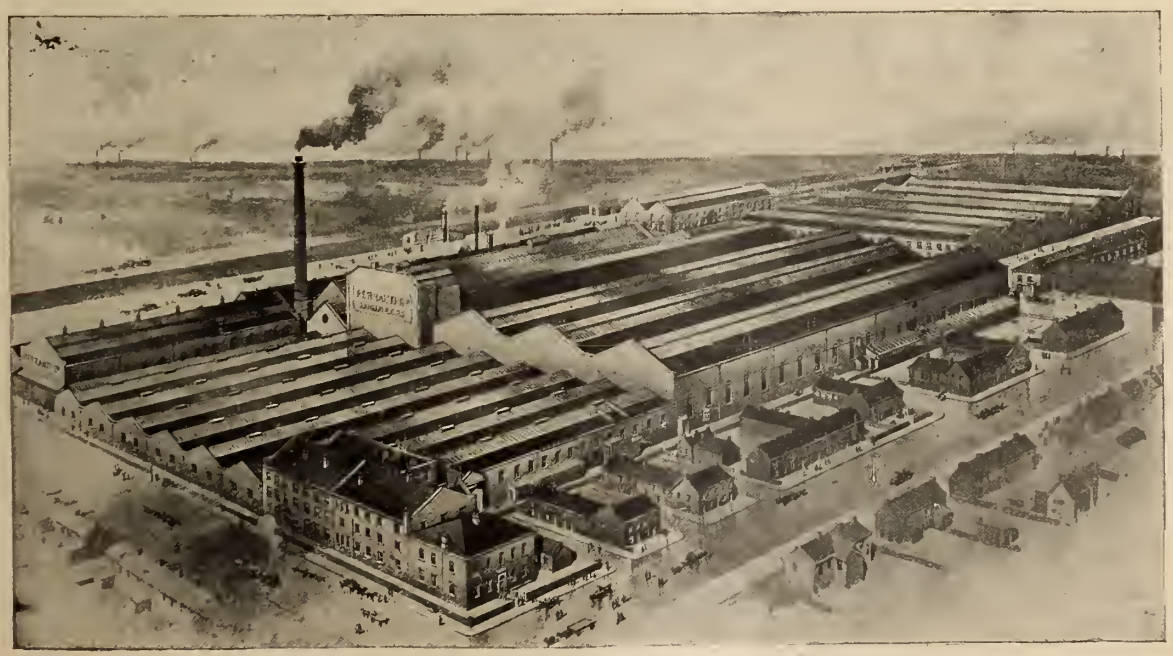
In the direct current versus alternating current controversy, Dr. Ferranti advocated the use of alternating current and although his opinions were for years outweighed, he has lived to see his views universally adopted.

In launching the Deptford scheme in 1888, he had the opportunity of showing how his theories worked out in practice, and with great courage he determined to transmit at the then unheard-of pressure of 10,000 volts. An illustration shows some of the transformers supplied in connection with the same scheme in 1892, and the fact that these were photographed in operation in 1922 shows how far-seeing was the design employed.

Dr. Ferranti, although associated so intimately with the early development of the electrical industry, is still relatively a young man—in his middle fifties—and still actively engaged in inventive and developmental work. During the war he directed his whole time and energy toward the speeding up of munition manufacture, particularly in the development of labor saving devices. During the last year of the war, Ferranti Limited, under his direction, turned out as many shells as one of the larger shell manufacturers having five times as many employees. Dr. Ferranti has been twice president of the British Institution of Electrical Engineers, and is one of the six honorary members of the American Institute of Electrical Engineers.

Annual Radio Exhibition

The second annual radio show will be held at the Prince George Hotel, Toronto, on September 6, 7 and 8. A number of leading manufacturers interested in radio, such as the Diamond State Fibre Company of Canada, Limited; the Northern Electric Company, Limited; the Canadian Independent Telephone Company, Limited; the Canadian National Carbon Company, Limited (Eveready ad Prest-o-Lite), etc., have already reserved space for their exhibits. Further information can be obtained by addressing the Canadian National Radio Show at the Prince George.



Ferranti, Limited's, factories at Hollinwood, near Manchester, England

500,000 H. P. Stolen From Canada Annually

Arbitrary and Unauthorized Diversion of 10,000 c.f.s. from International Waters by Chicago Sanitary District Robs Canada of the Equivalent of Thirty-five Million Dollars per Annum

By SIR ADAM BECK,
Chairman, Hydro-electric Power Commission of Ontario

In a press despatch from Chicago, under date of the 19th of July, 1923, President William J. Healy of the Sanitary District of Chicago is credited with stating that "there is not now any dispute between the Canadian authorities and the Sanitary District of Chicago," adding that "it was to eliminate the possibility of one that we took this trip."

The Sanitary District of Chicago is the territory, including the city of Chicago and its outlying areas, over which a specially appointed board exercises jurisdiction in respect of matters of sanitation.

President William J. Healy, accompanied by a number of officials of the Sanitary District of Chicago, recently made a tour through Eastern Canada, visiting Toronto, Ottawa and other places.

The object of this visit was to facilitate negotiations looking toward an adjustment of the difficulties in which the Sanitary District of Chicago finds itself by reason of its illegal diversion of water from the Great Lakes system to the Mississippi River. The water is diverted for the purpose of diluting the sewage effluent with sufficient water to render it inoffensive. The Sanitary District has at times been diverting an amount of water which is about equal to the amount which passes over the American Falls at Niagara.

The visiting committee announced that they are seeking authority from the United States Congress for the use of the water now being diverted from the Great Lakes system, and in this connection they evidently desired, if possible, to allay any opposition from Canadian interests on account of the great loss which Canadian interests have sustained by reason of this diversion.

As a remedial measure, the Sanitary District, according to its own statement, proposes to construct regulating works, one in the Niagara River below Buffalo, and another in the St. Lawrence River at Galops Rapids, at an estimated cost of $2,500,000, to be borne by the Sanitary District.

It is contended by the Sanitary District officials that these remedial works will restore the lake levels which have been disadvantageously affected by the diversion at Chicago.

Now, the whole subject to which these facts relate is one which has not been properly presented to the Canadian public by the visiting committee, and, moreover, such statements as have been made really tend to confuse the issue. The object which the Sanitary District of Chicago seek to attain is one of such vital importance to Canada as a whole, and to the water-power situation of the Province of Ontario in particular, that statements such as have been published in the press as a result of the visit of the Sanitary District officials cannot go unchallenged.

Navigation Interference

It is, of course, an obvious fact that the abstraction from the watershed of the Great Lakes of any large quantity of water such as the Chicago Sanitary District is diverting must materially affect the levels of the Great Lakes, producing, in consequence, a serious effect upon navigation. This aspect of the diversion is not denied, but is acknowledged by all the authorities that have dealt with the effect of Chicago's diversion. The United States Secretary of War, in an official decision refusing a former request from the Sanitary District of Chicago for 10,000 cubic feet of water per second from Lake Michigan, stated that such diversion would substantially interfere with the navigable capacity of the navigable waters in the Great Lakes and their connecting rivers. And he emphasized that the provisions of the Canadian treaty for a settlement by joint commission of "questions or matters of difference" between the United States and Canada offer a further reason why no administrative officer should authorize a further diversion of water, manifestly so injurious to Canada, against Canadian protest.

Every important navigation interest, from the head of the Great Lakes to the sea, has presented itself at the bars of various tribunals petitioning for remedy against loss to its navigation interests. The proposal of the Sanitary District is to install the regulating works just referred to so that they may be operated in a manner, so far as possible, to restore the levels for navigation. No matter what may be the means adopted for regulating the levels of the Great Lakes, their connecting waterways and the St. Lawrence River, it is clear that, with 10,000 additional second feet, the regulation could be made just that much better. In other words, it is impossible, by artificial means, to compensate the international waters for the thousands of cubic feet of water which are being continuously diverted from them by the Sanitary District. It is not my purpose to enter into any discussion of the navigation aspects of the situation. Navigation is an interest under the jurisdiction of Federal authorities, and it is assumed that the Federal authorities of Canada will spare no effort to fully safeguard Canada's interests in this respect.

The Court in the United States has declared against the large diversion being made by the Sanitary District of Chicago, but the Sanitary District has simply ignored such authoritative order against its diversion.

Canada's Power Resources Sacrificed

It is my desire rather to refer to the tremendous loss which the whole Dominion sustains by the illegal diversion at Chicago by reason of losing the hydro-electrical energy which might be developed from the large quantity of water which Chicago is diverting.

Chicago has a right, so far as independent sanction by the United States is concerned, to divert 4,167 cubic feet of water per second. This right, however, so far as I am aware, Canada has never conceded nor recognized.

The Sanitary District has not respected even the

limitations of this 4,167 cubic feet, but has been diverting in excess of 8,000 cubic feet per second, and, it has been rumored, has, at times, been diverting some 10,000 cubic feet, or possibly more, of water per second. This water, as just stated, is used for diluting the sewage of the city of Chicago and of other places of the Sanitary District, and is also employed for the development of hydro-electrical energy for the supply of light and power to places in the Sanitary District.

The development of hydro-electrical energy is an important factor in the operation of the Sanitary District. Even this phase of the Sanitary District's work, however, is conducted at the expense of other portions of the country, both in this Dominion and in the neighboring Republic. The power developed from the diverted water utilizes only a relatively small head on the water-course through which the diluted sewage passes to the Mississippi River, whereas this same water would develop many times the power in flowing to the sea via the Niagara and St. Lawrence Rivers. If 10,000 cubic feet of water per second were diverted by Chicago and were returned to its natural channel, then it would develop at the falls and rapids in the Niagara and St. Lawrence Rivers, approximately 500,000 horsepower, of which over 300,000 horsepower would belong to Canada—it will be recalled that a portion of the St. Lawrence River lies wholly in Canadian territory. Upon a conservative basis 500,000 horsepower may be considered the equivalent of 5,000,000 tons of coal per annum, and, at a recent price of soft coal, the equivalent of about thirty-five million dollars per year.

Compensation

Obviously, the proposal to make an investment in some permanent works of only $2,500,000, as is proposed by the Sanitary District, could not be taken into serious consideration as a means of compensating for an annual loss of upward of $35,000,000.

Now, the feature which cannot be too strongly emphasized is that it is impossible for the Chicago Sanitary District or any other agency to do anything by means of the regulation of levels of the Great Lakes to compensate the Dominion of Canada for its loss in the international waters which Chicago is diverting. No matter what is done in the way of compensating for levels, after the compensation is accomplished, 10,000 cubic feet of water diverted from the Great Lakes could not be restored to the Great Lakes and rivers and contribute, as an addition, all the benefits derivable from such quantity of water.

It is illegal without proper sanction to divert international waters from their natural course. These waters are the joint property of both countries. Every foot of water, therefore, which Chicago takes out of the Great Lakes is a direct loss to the Dominion of Canada, and is a loss, also, to the State of New York and to every State that might benefit from the United States' share of the diverted waters if allowed to course via their natural channel to the Atlantic.

There is another feature which should be appreciated, and that is that, even if remedial works are put in for the restoring of desired levels for navigation, the maintenance of such levels will doubtless require the holding back of water for storage purposes in order to maintain the levels, which water will be withheld at the expense of the flow which otherwise would be available for power.

The State of Michigan itself, the State of Wisconsin, the State of New York, the Provinces of Ontario and Quebec, and the Federal Governments both of the Dominion of Canada and the United States, have all registered strong protest against illegal diversion of the waters of the Great Lakes as is being done by the Sanitary District of Chicago.

Where Will Outrage Stop?

These various protests have, in effect, been ignored. The Sanitary District has continued to divert water greatly in excess of the 4,167 feet per second for which it has the sanction of its own Government, but, as stated, not the sanction of the Government of Canada. It cannot too clearly be understood that the Sanitary District is not seeking permission to divert water in excess of the 4,167 feet per second, because the Sanitary District actually is diverting water in excess of this licensed quantity, even up to some 8,000 or 10,000 feet per second, without securing permission from the proper authorities.

The Sanitary District, when designing its canals, evidently contemplates the course which it has pursued. The Chief of Engineers of the United States War Department, in a memorandum to the Secretary of War, stated that the canal works are now found to be large enough for a total diversion of 14,000 sec. feet; and, in fact, the late Chief Engineer of the Sanitary District himself stated that it was his hope and intention to excavate a channel with a capacity of 16,667 cubic feet per second.

The Sanitary District has been pursuing its own course, and what it seeks today is Governmental sanction for that which it has been doing and is still doing, illegally.

Lost Power a Great Loss

President Healy does not refer to some of the prominent features which must necessarily govern in any consideration involving Canada's interests as affected by the illegal diversion at Chicago. For example, even granting, for purposes of discussion, that the $2,500,000 would provide such compensatory works as the Sanitary District officials propose, such works would never compensate Canada for an annual loss of nearly ten times such a sum; that is to say, for the loss of a revenue equivalent to what would be produced from an investment of about $400,000,000.

When the time comes that a satisfactory recognition of Canada's rights may be secured, Canadian interests will not be sacrificed. Meantime it is desirable that the citizens of the Province of Ontario should know that there is nothing in the suggestions made by the officials of the Sanitary District who recently made the tour through Canada which are other than detrimental to the great water-power resources of this Dominion and of the Province of Ontario, and it is with this object that I have felt led to make a public statement respecting the true significance of the proposals which have so plausibly been presented.

Three hundred and fifty municipalities in the Province of Ontario, comprising practically all the cities, towns and villages in the more settled portions of the Province, and including the cities of Toronto, Hamilton, London, Ottawa, Brantford and Windsor, have invested in their municipally owned hydro-electrical undertaking $250,000,000, and in the future this

amount will annually be increased by millions of dollars.

The Province of Ontario owns the surplus waters flowing in boundary waters, including the St. Lawrence River, and the municipalities of Ontario do not propose that their large investments in their municipal hydro-electrical undertaking shall remain under the serious handicap consequent upon the Sanitary District of Chicago diverting such a substantial portion of the flow of the Niagara and St. Lawrence Rivers. By virtue of the fact that the Province of Ontario owns the surplus waters in international waterways bounding the Province, the diversion at Chicago occasions a loss which, especially from the water-power standpoint, falls directly upon the citizens of the Province of Ontario.

An Act Without Parallel

The action of the Sanitary District of Chicago in illegally diverting from the Great Lakes system the enormous quantity of water which is being turned into the Mississippi River is an act without parallel on the American continent. The citizens of Canada, and especially the citizens of Ontario, are concerned to know how much longer the United States authorities will permit the officials of the Sanitary District of Chicago to continue its diversion in defiance of every interest excepting the interests of the Sanitary District itself.

It is important for the citizens of this country fully to understand the significance of what is being attempted by the recent visit of the missionaries of the Sanitary District. Certainly, the citizens of Ontario are not misled by such inadequate and superficial propositions as have recently been presented by the officials of the Sanitary District of Chicago.

Newfoundland Has Big Power Project

On a recent visit to Montreal, Sir Richard Squires, former premier of Newfoundland, discussed at some length the Humber Power development which promises to form a very important factor in the industry of the island. This development is being undertaken by the Newfoundland Pulp and Power Company, which, after reorganization, succeeded the Newfoundland Products Company. "The work is proceeding most expeditiously," said Sir Richard. "There are now approximately 2,100 men employed and the progress is quite apparent. The Armstrong-Whitworth Company have brought from England a lot of material and rolling stock, such as dumpcars, which are not available in the island and this is aiding in the progress. The company has also brought out a number of technical men to direct operations.

200,000 Horsepower

"This year the work will be largely concentrated on the power end of the project and to changing the railroad so that it will be clear of the waters of the lake. It is hoped that in November, 1924, the work will be well advanced and that within two years the process of manufacturing will be a fact.

"The power development of the plant will amount to 200,000 horsepower or more and a considerable proportion of that will be required for the manufacturing plant which is designed for a production of 400 tons of paper daily."

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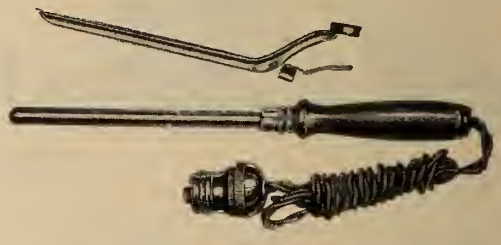
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It is the standard for surface wiring in either new or old work. It is a little less than one inch wide and one-half inch deep over all and will carry a maximum of four No. 14 or three No. 12 Single Braid Wires. There is also a complete line of Metal Molding Fittings to insure neat and inconspicuous work. Metal Molding may be painted any color—its Sherardized (rust proof) surface readily receives and holds either water or oil paints.

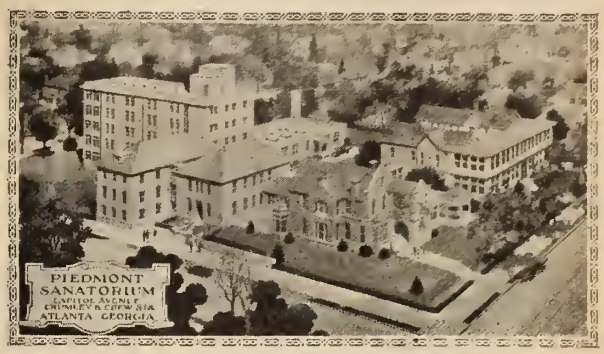
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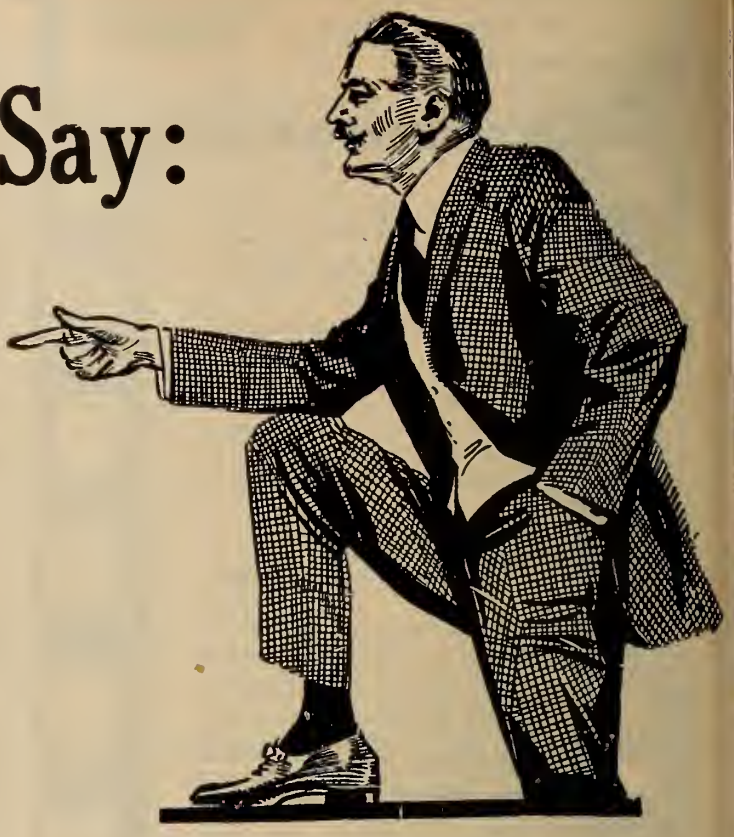
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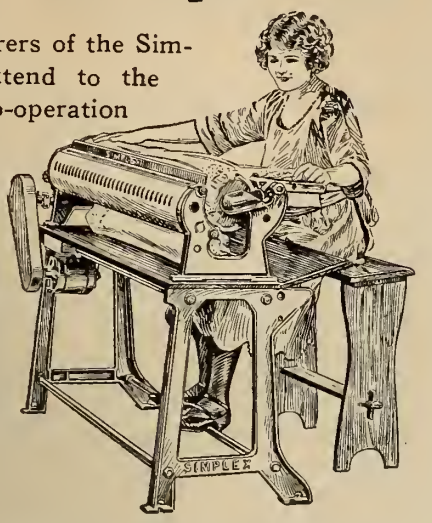
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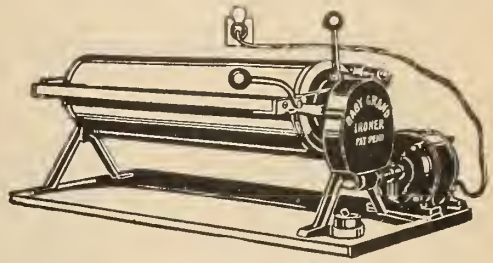
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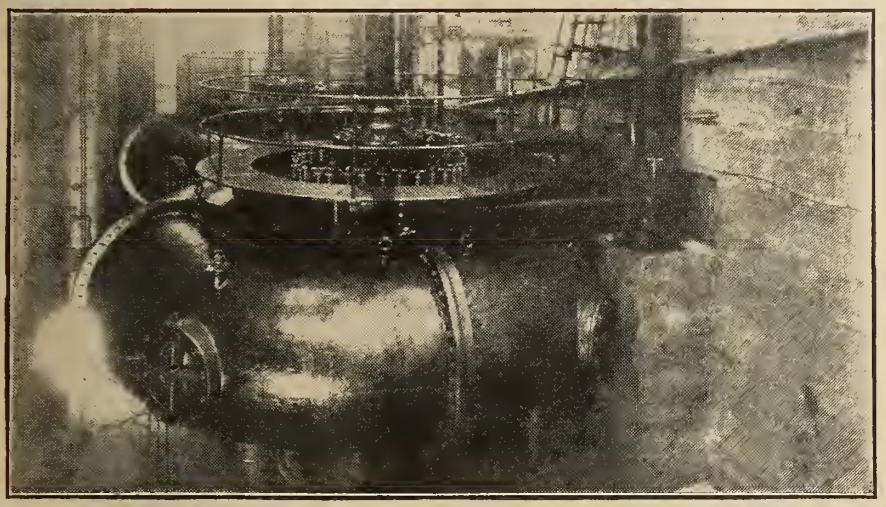
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Canadian Porcelain Co.
Slater Company, Limited, N.

INSULATING CLOTH
Packard Electric Company

IRONS (Electric)
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Canadian Westinghouse Company
National Electric Heating Company
Renfrew Electric Products

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Deming, B. R.
Ingersoll Machine & Tool Co.

LAMP BULBS (Electrical)
Jefferson Glass Company

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Canadian National Carbon Company
Canadian Westinghouse Company
Electrical Maintenance & Repairs Company
Northern Electric Company
Lightolier Mfg. Co., Ltd.

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Joyner, Co. Ltd., Winter
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Northern Electric Company
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Canadian Westinghouse Company
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Packard Electric Company
Rough Sales Corp., Geo. C.
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METER TESTING APPARATUS
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Kent Brothers
Mica Company of Canada
Mica Insulator Co.

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Canadian Fitzgerald Mfg. Co.
Canadian Crocker-Wheeler Company
Canadian National Carbon Company
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Northern Electric Company
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Metropolitan Engineering Co.

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Powerlite Devices Limited

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Canadian General Electric Company
Electric Power Equipment Corp.
Kennedy, William & Sons
Ferguson, Pailin Ltd.
Powerlite Devices Limited
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Northern Electric Company

Double the Life of Your Pole Lines

By using our
OPEN TANK TREATED

British Columbia Cedar Poles

They afford your pole lines better support, and add considerably to their appearance. Let us send you further particulars and prices. No obligation.

Lindsley Brothers Canadian Co., Ltd., Nelson, B. C.

Filer-Smith Machinery Company, Limited,
708 Confederation Life Building, Winnipeg, Man.
Irving Smith, M.L.C. Building, Cor. Craig and St. Alexander Sts. Montreal, Que.

Motors in Stock

60 cycle, 2 phase, 220 volt, Second hand Motors

No.	H.P.	Speed	Make
2	1	1800	Westinghouse
3	2	1800	T.H.E.
1	2	1800	Westinghouse
3	5	1800	Westinghouse
1	5	1800	T.H.E.
1	50	2200	Wagner—No starter

60 cycle, 3 phase, 220 volt, Second Hand Motors

1	1	1800	T.H.E.
1	2	1800	C.G.E.
1	2	600	C.G.E.
1	2	1800	Chapman Walker
1	7½	1200	T.H.E.
1	8	1800	T.H.E.
1	15	1800	Crocker Wheeler with Starter complete.

25 cycle, 3 phase, 550 volt

1	2	710	Century (new)
1	3	1500	T.H.E. (new)
1	7½	750	T.H.E.
1	10	1400	Imp. Electric with Starter complete.
1	40	710	Westinghouse CCL " " "
6	30	750	Crocker Wheeler " " "
1	15	1450	Westinghouse (new) " " "
1	50	720	Westinghouse H.S. " " "
2	50	750	Crocker Wheeler AQ " " "
3	20	750	Crocker Wheeler " " "

25 cycle, 3 phase, 220 volt, Second hand Motors

1	30	720	Westinghouse without starter
1	35	750	T.H.E. with starter complete
1	40	720	C.G.E. with starter complete

Toronto and Hamilton Electric Co., Limited

HAMILTON ONTARIO

MICA

Canadian Amber India Ruby

All forms of Mica Insulation.
Cut to size—Selected to Pattern—Segments.
Mica Splittings—Washers—Ground Mica.
A complete stock of Clear Ruby Mica for Stove and other purposes.

S. O. FILLION

Head Office: 86-88 Duke St., Ottawa, Canada

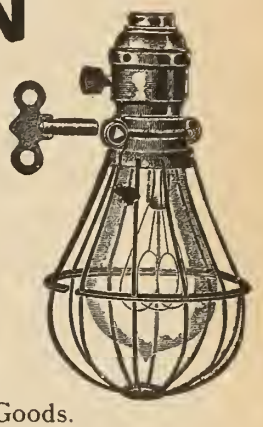
New York Office
86 Murray Street

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Kodarma, Benga

LAMPS Locked On Can't Get Stolen

They can't get knocked out or broken.

LOXON



guards give your lamps just such protection.
Sold at a popular price.
Our Loxon Lamp Guards and other Specialties demand the attention of every handler of Electrical Goods.

Let us send our list.

McGill Mfg. Co.

Valparaiso - - Indiana
U. S. A.

Motors in Stock

220 Volt, 3 Phase, 25 Cycle

2	H. P.	Westinghouse (CCL)	1400 r. p. m.
5	H. P.	Robbins & Myers	1500 r. p. m. Complete (New)

550 Volt, 3 Phase, 25 Cycle

3	H. P.	Lincoln Elec. Co.	1500 r. p. m.
5	H. P.	Swedish G. E.	1420 r. p. m. Complete
15	H. P.	Lancashire	1400 r. p. m. Complete
30	H. P.	Crocker Wheeler	720 r. p. m. Complete
50	H. P.	Crocker Wheeler	720 r. p. m. Complete
75	H. P.	Crocker Wheeler	720 r. p. m. Complete
75	H. P.	Westinghouse 2200 V.	450 r. p. m. Complete

220 Volt, 3 Phase, 60 Cycle

10	H. P.	Westinghouse (CCL)	1200 r. p. m. Complete
10	H. P.	Westinghouse (CCL)	1750 r. p. m. Complete

550 Volt, 3 Phase, 60 Cycle

5	H. P.	C. G. E.	1200 r. p. m. Complete
5	H. P.	Westinghouse (CCL)	1200 r. p. m. Complete
10	H. P.	C. G. E.	1800 r. p. m. Complete
15	H. P.	Westinghouse (CCL)	900 r. p. m. Complete
30	H. P.	Crocker Wheeler	900 r. p. m. Complete
40	H. P.	C. G. E.	1800 r. p. m. Complete
50	H. P.	Westinghouse	600 r. p. m. Complete
300	H. P.	A. C. B. 2200 Volt, 3 Ph., 60 Cy., 430 r. p. m. 3 Bearing. Complete with Pulley, Base & New Starter.	

Large stock of Single Phase Motors in 25 Cycle.
Also several 25 Cy. Transformers 50-750 Kva.

Prompt and Reliable Service on

REPAIRS, REWINDING, REBUILDING

The Sterling Electrical Company
St. Catharines, Ont.

W. Mackenzie E. A. Dodington

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Benjamin Electric Manufacturing Co.
McGill Manufacturing Company

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National Electric Heating Company

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Ferranti Meter & Transformer Mfg. Co.
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Canadian Westinghouse Company
Equator Mfg. Co.
National Electric Heating Company
Renfrew Electric Products

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TOY TRANSFORMERS
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Canadian Crocker-Wheeler Company
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National Metal Molding Co.
Northern Electric Company

Crown Electrical Mfg. Co. Limited

Brantford Ontario

Designers and Makers of the Crown line Lighting Fixtures

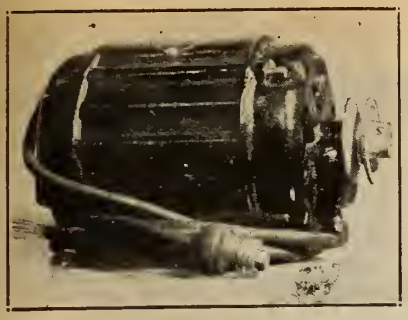
Write for a copy of our new catalogue No. 16 to-day. Note the special features, twenty pages of fixtures, that we can guarantee shipment in twenty-four hours.



No. 17119

"Notice the Lighting Equipment"
"Everywhere you go"

While our business has grown to very large proportions, our manufacturing facilities have increased accordingly so that we are able to serve the trade more satisfactorily than ever before.



EXTRA!

¼ Horse MOTORS

$18.00

Without doubt we have the greatest buy in Washing Machine Motors on the Continent. Made under our supervision and fully guaranteed by us for 1 year.
SPECIFICATIONS: ¼ H.P. 110 V. 25 Cy.

All single phase. Prices F.O.B. London. No tax.

LEFF ELECTRIC COMPANY
316 Grey St., LONDON, ONT.



WE HAVE unexcelled manufacturing and shipping facilities for meeting your requirements of

Copper, Brass and Bronze Wire.
Insulated Wire of all kinds.
Copper Clad Steel Wire.
Lead Covered and Armored Cables.
Cable Terminals, Junction Boxes, etc.

Write our nearest office

Standard Underground Cable Co. of Canada, Limited
Branch Offices and Warehouses
Montreal Toronto Hamilton Seattle Winnipeg

STANDARD TRADE MARK

Century

Type S. C.
INDUCTION



POLYPHASE MOTORS

are designed to meet the existing demand for a motor which is capable of that "Keep-A-Running" ability which is found in all Century products.

Temperature Rise not over 40° Centigrade

THEY KEEP-A-RUNNING

CENTURY ELECTRIC CO.

1827 Pine Street ST. LOUIS, Mo., U.S.A.

Stock carried in Canada by:
Jones & Moore Electric Co. Ltd., 294 Adelaide St. W., Toronto
Great West Electric Co. Ltd., Winnipeg
Rudel-Belnap Machinery Co. Ltd., Canadian Express Bldg., Montreal
Rankin & Cherrill, 55 Hastings St. W., Vancouver, B.C.



We have ready for shipment a counter display stand with a capacity of fourteen (14) lamps and above is shown an actual photograph of this stand. The cards shown are merely a suggestion of the advertising aids rendered by our display stand.

The stand is our own display and is sold exclusively by us. Is made of steel with a cast base and is finished in antique bronze. It is fourteen inches in diameter by twenty-two and a half in height with a base of ten inch diameter. The receptacles used are standard metal sign type finished to match the metal and a slip test socket is fitted in the base.

We offer this stand to dealers wired but less lamps at a price of Fifteen Dollars ($15.00) each F.O.B. Montreal. No dealer can afford to be without one as a reminder to his customers of the lamps required in the home. Extra lamp sales made through this medium in a very short time pay for the stand.

L .C. Barbeau & Co. Limited,
320 St. James St. Montreal
Wholesale Electrical Supplies

HIGH GRADE

BRUSHES

Carbon, Graphite, Metal Graphite

For ALL TYPES of Motors and Generators

Made in Canada

Orders shipped Promptly



DOMINION CARBON BRUSH CO.
38 Duke St., TORONTO
E. W. Playford, 358 Beaver Hall Sq., Montreal

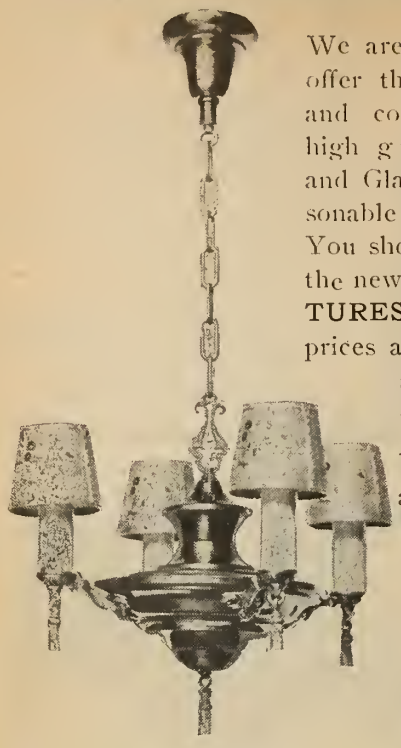
For attaching purposes, use PAINE EXPANSION SHELLS, in concrete, brick, or stone. PAINE SPRING TYPE TOGGLE BOLTS work instantly in any position in any hollow material. PAINE OUTLET BOX AND FIXTURE HANGERS for lath and plastered or tile ceilings.

Made in Canada. Patented in Canada.

Send for samples and prices.

The Paine Co. of Canada

GEO. H. BROUGHTON, Manager
122 Wellington St. W. Toronto, Ont., Can.



We are now ready to offer the trade a new and complete line of high grade Fixtures and Glassware at reasonable prices.

You should investigate the new **MASCO FIXTURES** at once. The prices as well as style and finish will surprise you.

Write for catalogue to

The Masco Company, Ltd.

76-78 RICHMOND ST. EAST, TORONTO

Jobbers of Standard Electrical Merchandise

"Notice the Lighting Equipment"



RayLite

Whenever the Lighting Equipment is the result of extreme test for quality and efficiency, Raylite is almost invariably chosen.

No other unit can show such an imposing list of satisfied users.

NOTE A FEW OF THEM

Sudbury Technical and Mining School.
St. Catharines Technical School.
Hamilton Technical School.
Toronto, Ottawa, Hamilton School Boards.
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MADE IN CANADA BY

TALLMAN BRASS & METAL Limited

Hamilton, Canada

The Newest Sales Light



THE dealers get close touch with the great home market with the latest line of Consolidated Portables.

The large variety of designs, the many types of harmoniously colored shades, make a direct appeal to the seeker of better home furnishings.

You will sell not just one Portable to a home, but many. The hall, living room, study, and even the dining room, are incomplete without the beauty and touch of distinction that the Consolidated Portables assure.

One of the latest line of Consolidated Portables

91 exclusive designs, including 20 Boudoir Lamps. Hand-decorated shades in permanent colors and tints.

Consolidated Lamp & Glass Co.

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R. E. DAVIS, Canadian Representative
113 Wortley Road, LONDON, ONT.



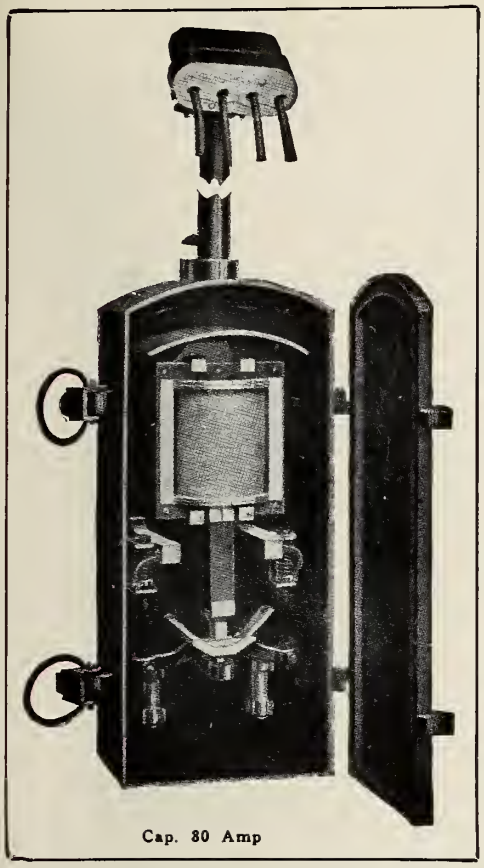
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Electrical Fixtures which harmonize with the most elegant surroundings.

Our catalogue will bring you new ideas. Write today.

Lightolier Mfg. Co., Limited

40 St. George St., Montreal



Cap. 30 Amp

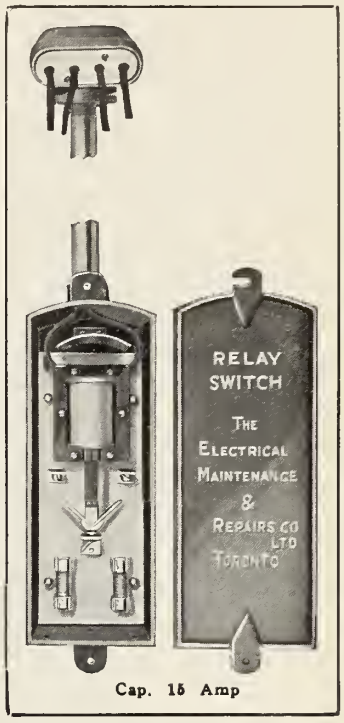
Engineers, Take Notice!

A new, smaller, simplified Remote Control Switch.

A young friend of our 30 Amp Switch—to do the many small jobs where the big fellow is too expensive.

Cheaper, yet perfectly dependable. Has been tested equal to five years' service.

For Street Lighting Control. Write about this.

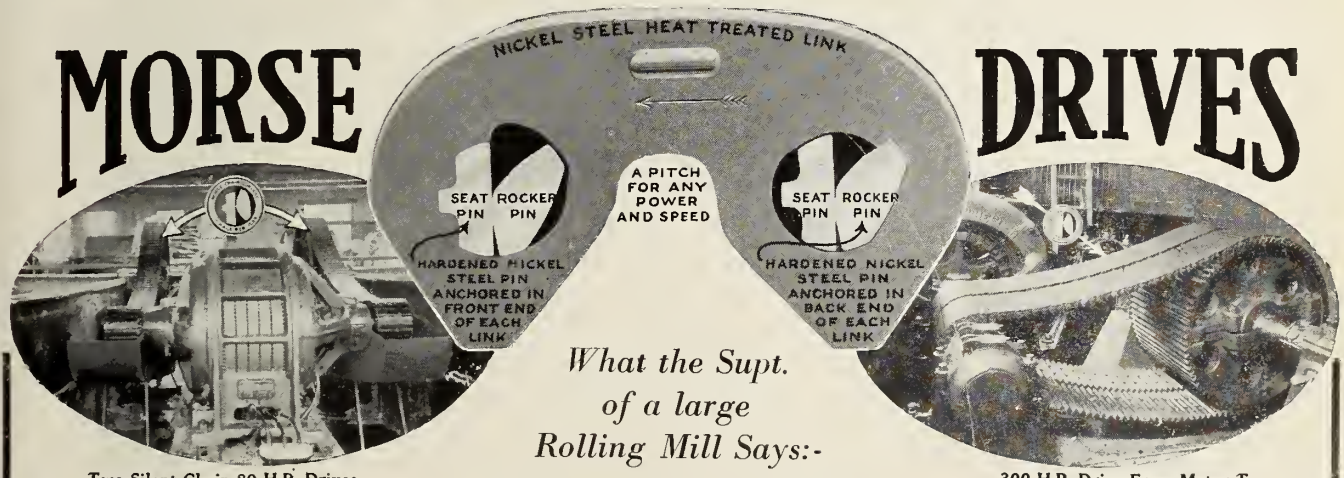


Cap. 15 Amp

The Electrical Maintenance & Repairs Company, Limited

162 Adelaide Street West **Toronto**

MORSE DRIVES



Two Silent Chain 80 H.P. Drives

300 H.P. Drive From Motor To Beater Line Shaft

What the Supt. of a large Rolling Mill Says:-

"When we erected our rolling mill in 1914 the question of what we should use for driving the mills came up and it was either chain drives or gears. Our decision rested with Morse Silent Chain Drives because first, of their reputation, second, because they were more economical than gears, third, because there was less chance of breakage with Morse Chains. Two 600 H. P. Morse Chain Drives are driving our rolling mills and practically all our motors about the Plant are also now equipped with Morse Chains.

"Our first which was one of the 600 H. P. was purchased eight years ago and today it hasn't cost us anything for repairs—and has given us absolutely no trouble. This is merely typical of our experience with this equipment. Our Morse Drives have had unusually hard usage for easily 50 per cent. of the time they have been in operation practically 24 hours out of each day on work that is a severe test because the load is not constant."

Canadian Agents

JONES & GLASSCO, REG'D.

Bank of Hamilton Bldg., Toronto **St. Nicholas Bldg., Montreal**

See the new range at

Canadian National Exhibition, Toronto

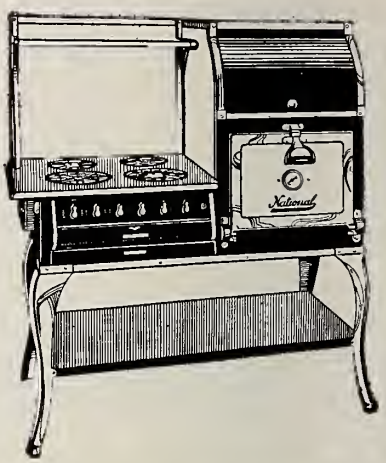
—your opportunity to see the wonderful new range with the revolutionizing change in burners that has made such a stir all through the trade!

By far the greatest feature of electrical interest at the fair!

Also see the famous National Electric Heatray, National Electric Toasters, Irons, etc.—Industrial Building, South East corner of North Wing.



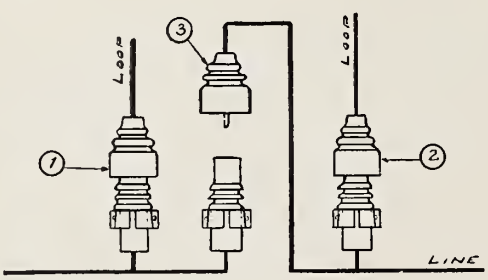
The New *National Electric* Burner



National ELECTRIC RANGE

The National Electric Heating Co. Limited,
Toronto, Montreal, Winnipeg, Vancouver,
Makers of National Electric Ranges, Electric Ranges, Electric Heaters, Irons, Hot plates, etc.

CABLE TERMINAL DEVICES



G & W Economical Sectionalization as Applied to Street Lighting

At every point where a looo is taken off your street lighting mains install three Type S, G and W Potheads, as illustrated in the diagram. These may then be operated "alive" as follows:

The line enters the bottom of pothead No. 1 and leaves the bottom of pothead No. 2. The loop is connected to the caps of potheads No. 1 and No. 2. Pothead No. 3 is shunted across the line and in normal service stands disconnected. When it is desired to disconnect the loop, closing the cap on pothead No. 3 allows the loop caps of potheads No. 1 and No. 2 to be pulled to disconnect the loop.

POTHEADS, DISTRIBUTION BOXES

The question which naturally arises in your mind at this point is, "Well, the idea is all right, but why not buy a switch to do the job instead of potheads?"

Here is the answer. The potheads are simpler, safer and more sightly. Once installed they are all out in the open where the man who is handling them can see what he is doing. There is no iron case that is apt to be "hot". But the best part of it all is that the cost of doing it the right way—with potheads—is the least expensive way. All logical engineers say "USE G AND W POTHEADS."

Catalogs, blue prints, prices, suggestions, in fact any information desired sent on request.

G & W ELECTRIC SPECIALTY CO.
Chicago Illinois

Representatives in All Principal Cities
Powerlite Devices Limited, 62 Front St. W., Toronto
Powerlite Devices Limited, New Birks Bldg., Montreal
Bentz-Richardson Co. Ltd., 592 Notre Dame Avenue, Winnipeg.
General Supplies, Limited, Calgary and Edmonton

G & W ELECTRIC SPECIALTY CO.

Vol. XXXII No. 18 Toronto, September 15, 1923

Electrical Engineering Contracting News Merchandising Transportation



Adjusto-Lite

A FARBERWARE PRODUCT

Reg. Can. Pat. Off.

Made in Canada

GENUINE!

Boost your business with the genuine Adjusto-Lite—the handy, practical electric lamp that clamps everywhere.

Carry the original article—the article with the world-wide reputation. And put in a window display to tell your customers you handle the genuine **Adjusto-Lite**—the one that's advertised. Packed in attractive cartons that help sales. Shipments F. O. B. Brantford, Ontario.

RETAIL PRICE

$5

West of Rockies and in Maritime Provinces 25c. higher



Pat. Canada, U. S. A. and Foreign Countries

Ask your jobber now for the genuine

Adjusto-Lite

A FARBERWARE PRODUCT

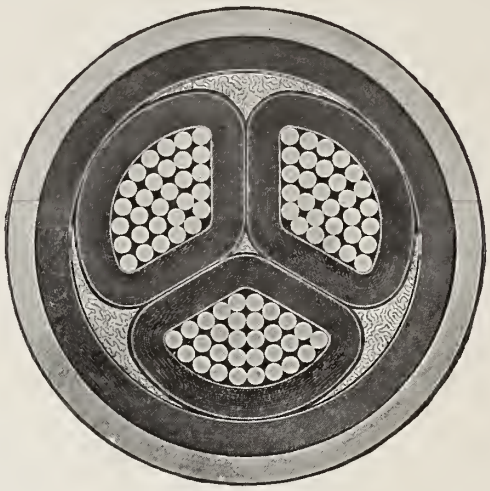
Reg. Can. Pat. Off.

or write for prices to

S. W. FARBER, Inventor

141-151 S. Fifth Street, Brooklyn, N.Y.

Alphabetical Index to Advertisers, Page 8 Classified Directory to Advertisements, Page 90



16¼ Miles
3 Conductor 250,000 C. M.
Paper Insulated Lead Covered Cable
13,200 Volts Working Pressure

Manufactured and Installed for

The Toronto Electric Commissioners

To Their Specifications

Insulation	.42″
Lead Sheath	.16″
Approximate Outside Diameter	2.6″
Approximate Weight Per Foot	10.5 lbs.

Northern Electric Company
LIMITED

MONTREAL TORONTO WINDSOR CALGARY
HALIFAX HAMILTON WINNIPEG EDMONTON
QUEBEC LONDON REGINA VANCOUVER

"Makers of the Nation's Telephones"

MANUFACTURING
Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and receiving Equipment

DISTRIBUTING
Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

EUREKA

Why it is called
THE GRAND PRIZE
Vacuum Cleaner



SIX international grand prizes and highest awards of merit bestowed by the experts of both the old world and the new —this is the reason the Eureka was named "the Grand Prize" Vacuum Cleaner. Here are the awards as won by Eureka in competition with the world's best—

1. Grand Prize, the Highest Award Obtainable at Panama-Pacific Exposition, San Francisco, 1915.
2. Gold Medal and Grand Prize at Inter-European Hygienic Exposition, Brussels, Belgium, June, 1920.
3. Grand Prize and Gold Medal at Exposition Industry, Milan, Italy, July, 1920.
4. Highest Award Diploma and Gold Medal at Ideal Home Exposition, Amsterdam, Holand, July, 1920.
5. Grand Prize and Gold Medal at Exposition D'Hygiene, Paris, France, May, 1921.
6. Highest Award—Silver Medal—Royal Sanitary Institute, London, Eng., 1922.

That the choice of the experts was the logical one is ably supported by the 800,000 users of this wonder vacuum cleaner. They are as one in proclaiming Eureka a marvel of efficiency, convenience, simplicity, dependability and economy.

No other cleaner embodies such an effective combination of simultaneous brush and air cleaning.

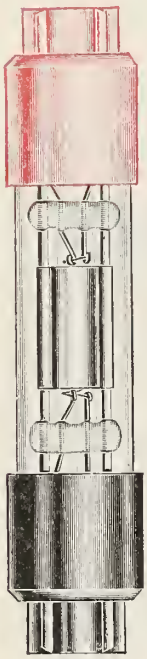
If you are interested in substantially increasing your vacuum cleaner sales, let one of our representatives place before you the Eureka proposition.

WRITE TODAY

Eureka Vacuum Cleaner Co.
Kitchener — Ontario

The Tube's the Thing!

FOR GOOD RADIO RECEPTION
ONLY GOOD TUBES CAN BE USED



(*Full Size*)

Myers Tubes

ARE DESIGNED PURELY FROM THE STANDPOINT OF THEIR REQUIREMENTS AS RADIO EQUIPMENT

This design brings the leads from the grid and the plate of the tube out of opposite ends: in this way the capacity of the tube is reduced and the efficiency greatly increased. In plain words this means that by bringing the leads out of the different ends instead of all in a bunch at one end the large electrical capacity effect so harmful to the proper operation of a Radio Vacuum Tube is eliminated. All elements of the Myers Tube do their work properly and do not interfere with each other.

$5. DETECTOR
AMPLIFIER
OSCILLATOR

Tried and Found to be the Best in Every Country in the World

MYERS DRY BATTERY TUBE
2½ VOLT–¼ AMPERE
FOR OPERATION ON
2 DRY CELLS

Either Type
FIVE DOLLARS
COMPLETE WITH MOUNTING CLIPS READY TO BE MOUNTED ON YOUR SET. NO ADDITIONAL SOCKETS OR EQUIPMENT NECESSARY

MYERS UNIVERSAL TUBE
FOR OPERATION ON EITHER
3 DRY CELLS OR STORAGE BATTERY

MADE IN CANADA

Under Canadian Patents No. 229,182, Patent No. 229,183, Patent No. 229,184, and many other patents issuing and ending

EXCLUSIVELY BY

Jobbers Dealers Telegraph or Telephone for Discounts and Territory Still Open.

F. B. Myers Co. Ltd.
Radio Vacuum Tubes

Your trade will demand Myers tubes—be prepared—put in your stock now.

240 Craig Street West *Telephone Main 7822* MONTREAL, QUEBEC

CANADIAN PORCELAIN CO.

LIMITED

HAMILTON - CANADA

Manufacturers of High and Low Tension Porcelain Insulators

Thomson Electric Motors

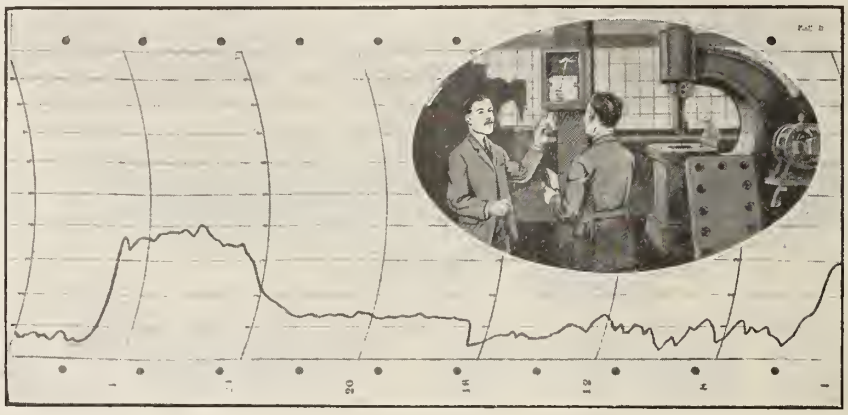
in use in many of the largest manufacturing plants in Canada

are built by

FRED THOMSON CO., LIMITED

ELECTRICAL ENGINEERS

7-13 ST. GENEVIEVE STREET MONTREAL

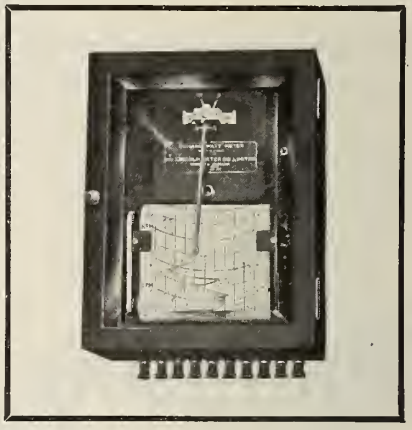


Suggest Graphics to Your Customers and Benefit in Two Ways

CENTRAL station men who take an interest in their customers are highly regarded.

Consider the matter of graphic meters, for example. What customer wouldn't appreciate being shown how a Graphic Meter enables him to investigate each machine in his plant? Who wouldn't like to be shown how a Lincoln Graphic records definitely the maximum demand and the time at which that maximum occurs?

By making such suggestions you gain in another way, too, Mr. Central Station Manager. If your customer balances **his load** (because of records which he obtains on his Lincoln Graphic) **your load** curve is improved. Suggest a Graphic—suggest a Lincoln—the only Graphic meter which always traces a smooth, legible, no-smear curve.



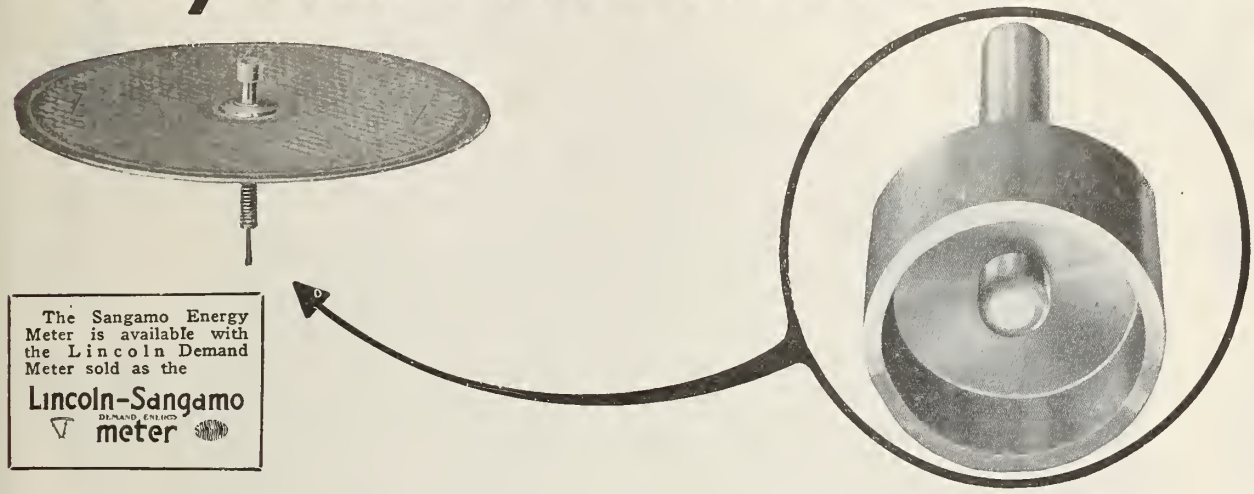
Write for Section IV of the Lincoln Meter Catalog. It describes the purposes of the Lincoln Graphic Demand Meter.

The Lincoln Meter Co., Limited
72-74 Stafford Street, Toronto, Canada
Cable "Meters" Toronto. Phone Adelaide 3969

The Lincoln Demand Meter is available with the Sangamo energy Meter—sold as the Lincoln-Sangamo DEMAND, ENERGY meter

Lincoln MAXIMUM DEMAND meter

Sustained Meter Accuracy Depends on Pivots and Jewels



The Sangamo Energy Meter is available with the Lincoln Demand Meter sold as the
Lincoln-Sangamo DEMAND ENERGY **meter**

THE excellent quality of pivots and jewels is one of the factors responsible for the sustained accuracy of Sangamo Type "H" alternating current watthour meter.

Performance in service is the real test of a meter bearing. "The proof of a pudding is in the eating thereof," and an abundance of evidence covering years of service has demonstrated the excellent wearing qualities of Sangamo pivots and jewels. Numerous service tests have shown that after many million revolutions of the meter disc neither the jewel nor pivot show the slightest wear.

THE PIVOT DUST GUARD shown in the illustration provides a practically dust-proof protection for the jewel bearing. Since it is mounted on the pivot and projects downward, completely enclosing the jewel and pivot, dust and particles are shed away from the jewel, not into it.

The pivot guard at the same time serves as a protection for the polished surface of the pivot and prevents it from being touched in handling when removed from the meter for inspection.

There are many other reasons why the Sangamo meter has so many friends. Let us tell the whole story. Send today for Bulletin No. 55-C describing Type H alternating current watthour meters.

SANGAMO

Sangamo Electric Company of Canada, Limited

Factory: TORONTO **Head Sales Office: MONTREAL**

2073

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Rubber Covered Wires and Cables

FOR POWER, LIGHT AND TELEPHONE WORK

Incandescent Lamp Cord, Flexible Switchboard Cables, Special Cords and Cables for all kinds of Electrical Work.

Prompt Shipments from Canadian Factory.

BOSTON INSULATED WIRE & CABLE CO., Limited

Canadian Office and Factory, HAMILTON, ONT.

GALVADUCT



LORICATED

A Galvaduct Building
Physicians and Surgeons Building, Toronto
Roxborough and Dean, Electrical Contractors

"GALVADUCT"

The most perfect interior construction conduit on the market.

Recognized as the standard of high quality.

Always specify Galvaduct or Loricated CONDUITS.

"LORICATED"

A high-class interior construction conduit of the enameled type, proof against acid or other corrosive agents.

If your jobber cannot supply you—write us.

CONDUITS COMPANY LIMITED

Head Office and Factory—Toronto

Western Sales Offices: Winnipeg and Vancouver

XCELADUCT

Approved by the Hydro-Electric Commission of Ontario
Labelled under supervision of Underwriters' Laboratories

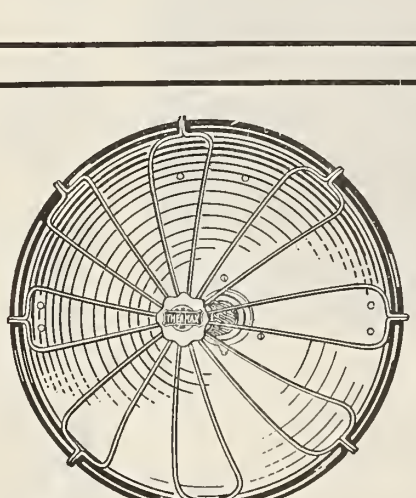
GALVANIZED

Made in Canada Conduit

Electrical Wiring Made Safe

For All Electrical Installations

Manufactured by
National Conduit Co., Limited
Toronto



No. 3952

PREPARE

The Fall Season will soon be here with the usual sudden **demand** for Heaters and Heating Devices.

Dont be caught! Assure Yourself of delivery—by ordering **now**—with any shipping date you desire.

Our proposition on Portable Heaters is the best we have ever offered.

Write us at once for full details.

GREAT WEST ELECTRIC CO., LIMITED
87 KING ST., WINNIPEG



Our First Window Trim For This Season

ILLUSTRATED above is the new Edison Mazda Lamp Window Trim No. 109A. The centre-piece stands 30″ high, and is a reproduction of our first newspaper advertisement, which will appear this month.

Many attractive arrangements for featuring this trim are illustrated in the Edison Mazda Blue Book, which has already been distributed to our agents. The trim itself will be sent out in plenty of time to enable agents to feature it in their windows at the same time as our national advertising appears.

If you are not already an Edison Mazda Lamp Agent, we would suggest that you get in touch with our nearest district office and investigate the money making possibilities of handling Edison Mazda Lamps.

"Made in Canada" by

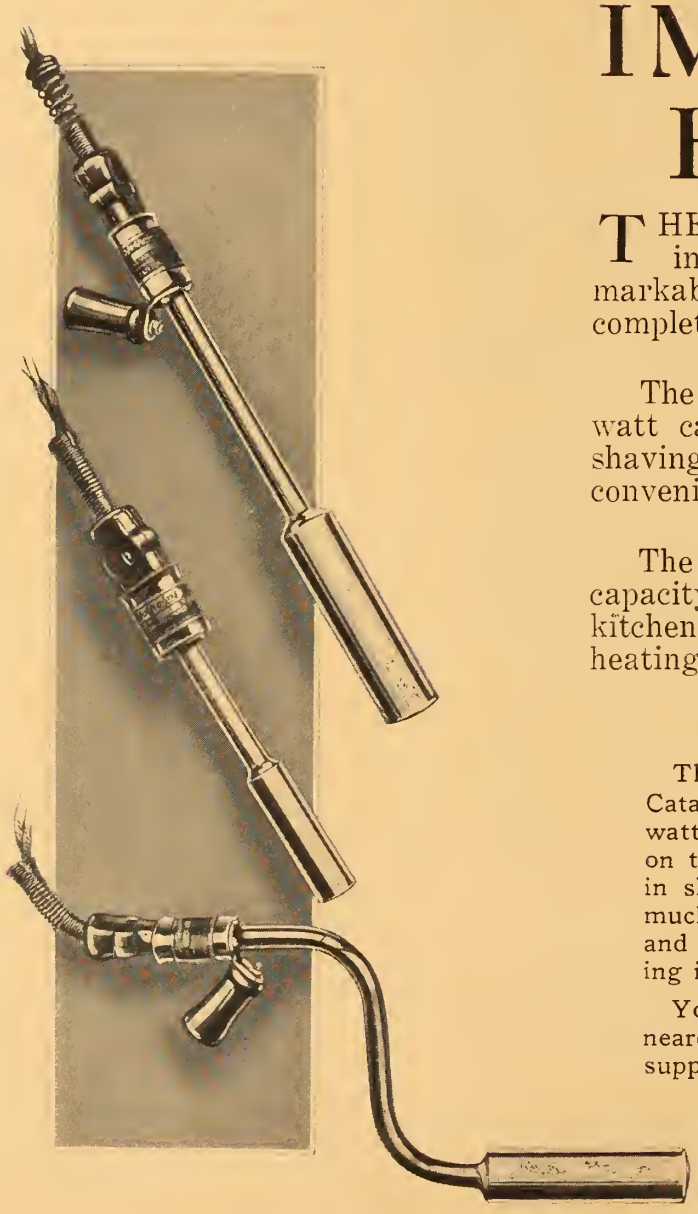
EDISON LAMP WORKS

of

Canadian General Electric Co., Limited

Hotpoint

IMMERSION HEATERS



THESE appliances quickly heat any liquid into which they may be placed, and are remarkably efficient as the heating elements are completely surrounded by liquid.

The small size, Catalogue No. W15, is of 300 watt capacity and is invaluable for heating shaving water or babies' bottles. It is also very convenient for travellers.

The larger size, Catalogue No. W16, 500 watt capacity, may be put to innumerable uses in the kitchen, such as keeping soups, etc., hot or for heating liquid foods of all descriptions.

The crookneck type Catalogue No. W17, 500 watt capacity, will lie flat on the bottom of a dish, in shallow liquid, and is much used by Doctors and Dentists for sterilizing instruments.

Your jobber or our nearest Sales Branch can supply you.



"Made in Canada" by

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited

Hotpoint



THE STANDARD BY WHICH ALL OTHER IRONS ARE JUDGED



THE Hotpoint Iron maintains its enviable position, simply and solely through its quality. It is built up to a standard not down to a price.

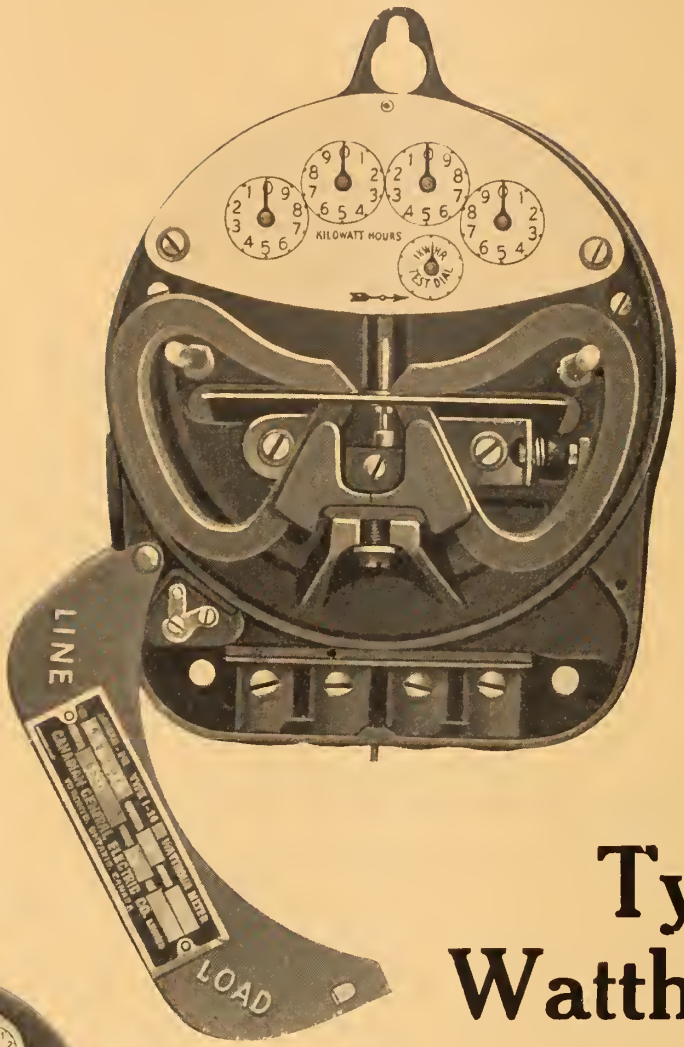
As a rule, the first electrical appliance a woman buys is an iron. It is, therefore essential that she secure complete satisfaction, in order that the road may be paved for further sales. To create prestige for your store, sell your customers the famous Hotpoint Iron.

"Made in Canada" by

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited



Type I-14 Watthour Meters



THE I-14 Watthour Meter increases in popularity year after year. All parts are easily accessible and can be removed for inspection without trouble. Examination of parts does not disturb any adjustment, and if for any reason the meter is disassembled, it may be put back with the assurance that the relative position of the various elements is the same as when originally assembled.

The register is elliptical in shape and of the four dial type equipped with a test pointer. Enamelled dial face with legible numerals and permanent pointer, makes reading easy. The gears and pinions are subject to rigid inspection for roughness and bad alignment before being used.

The unit type insulation makes it possible to renew the insulation or terminals without the necessity of returning the meter to the factory.

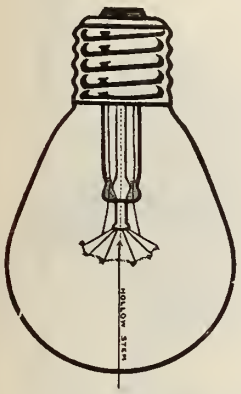
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Canadian General Electric Co., Limited

HEAD OFFICE TORONTO

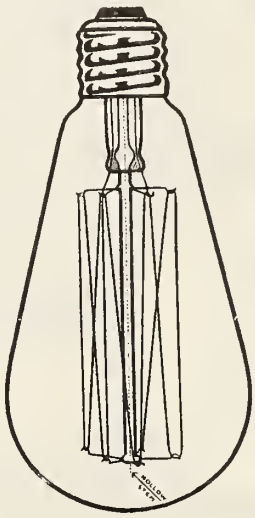
Branch Offices: Halifax, Sydney, St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

TIPLESS *Dalyte Holo-Stem* LAMPS



The development of DALYTE "HOLO-STEM" TIPLESS lamps marks the greatest advance in the art of incandescent lamp manufacture since tungsten alloy metal filaments were produced.

DALYTE "HOLO-STEM" TIPLESS lamps are protected by Wheeler Patent Pending, also by Trade-mark Registered, and are manufactured only by Dalyte Electric Ltd., Guelph, Canada.

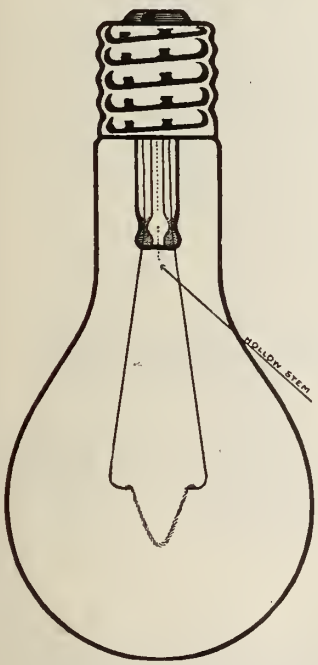


DALYTE "HOLO-STEM" TIPLESS lamps are made in all types and sizes from 5 watt to 1,000 watt, and the quality is positively unexcelled.

The "HOLO-STEM" method of construction is entirely new and novel and absolutely eliminates the glass stresses that are so prevalent in other makes of tipless lamps.

The demand for DALYTE "HOLO-STEM" TIPLESS lamps is already enormous, and in order that you be prepared to meet it, would suggest that you get in early communication with our nearest branch or Distributor—the list of same follows:

Dalyte Electric Ltd., 325 Howe St., Vancouver. Dalyte Electric Ltd., 556 Aylmer St., Montreal.



Dalyte Elecric Ltd., 163½ Church St., Toronto.

Dalyte Electric Ltd., Sanford & Main Sts., Hamilton.

Sumner & Co. Ltd., Moncton, N. B.

H. M. Hopper, 57 Dock St., St. John, N.B.

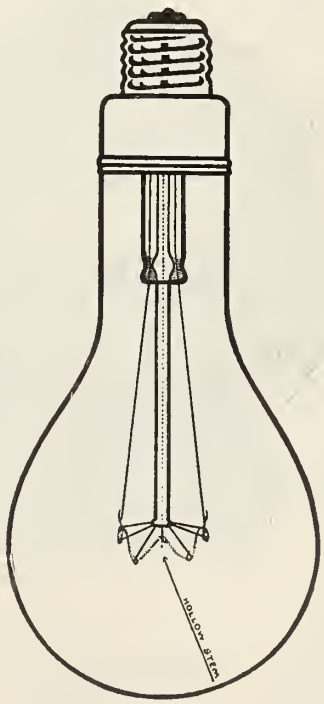
La Cie des Nouveautes "UNIVERSEL", 211 rue Des Fosses, Quebec City.

E. H. Briggs & Co., 619 Avenue Bldg., Winnipeg, Man.

Stratton-Steward Ltd., 239—10th Ave. E, Calgary, Alta.

The Western Lighting Agencies, 109—23rd St. E, Saskatoon, Sask.

Midland Electric Co. Ltd., 3129—10th Ave., Regina, Sask.



Head Office and Factory:

Dalyte Electric Limited

Guelph, Ont., Canada

"EQUATOR" ELECTRIC HEATERS



Cat. No. A 7
$8.50

THE DEPENDABLE LINE

Fully Guaranteed and Approved by the
Hydro Electric Power Commission

GET READY FOR
FALL NOW

LIST
$8.50

LIST
$6.50

EQUATOR MFG. CO., LTD.
HAMILTON - CANADA



Cat. No. A 17
$6.50



DUNCAN

Watthour Meters

for Sustained Accuracy
Through Years of Service

THE GEORGE C. ROUGH SALES CORP'N. 134 CORISTINE BLD'G. MONTREAL

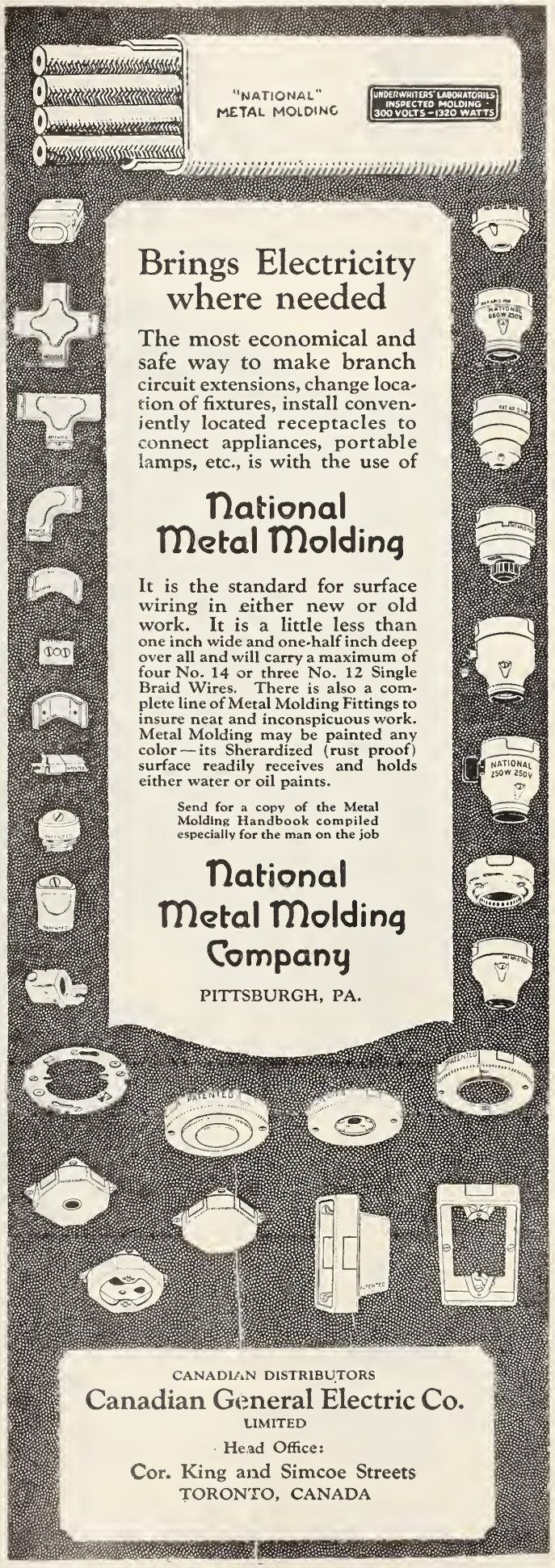
"Pigs"

—that's what they call Marshall's Live Line shields —**Just pigs!**

But gosh, what a comfort they are to the Man-on-the-pole absolute protection against 20,000 volts. They save time, money—and regret!



Linemen Protector Company
850 Penobscot Building
Detroit, Mich.



Brings Electricity where needed

The most economical and safe way to make branch circuit extensions, change location of fixtures, install conveniently located receptacles to connect appliances, portable lamps, etc., is with the use of

National Metal Molding

It is the standard for surface wiring in either new or old work. It is a little less than one inch wide and one-half inch deep over all and will carry a maximum of four No. 14 or three No. 12 Single Braid Wires. There is also a complete line of Metal Molding Fittings to insure neat and inconspicuous work. Metal Molding may be painted any color—its Sherardized (rust proof) surface readily receives and holds either water or oil paints.

Send for a copy of the Metal Molding Handbook compiled especially for the man on the job

National Metal Molding Company

PITTSBURGH, PA.

CANADIAN DISTRIBUTORS
Canadian General Electric Co.
LIMITED
Head Office:
Cor. King and Simcoe Streets
TORONTO, CANADA

Jefferson
MADE IN CANADA

LIGHTING UNITS

FOR EVERY REQUIREMENT

1060 Series



Supplied in Cased-Glass

	Diam.	Depth	Fitter
No. 1060 —	12″	7″	6″
No. 1061 —	14″	8″	6″
No. 1062 —	16″	9″	6″
No. 1063 —	18″	10″	8″

396 Series



Supplied in Moonstone R. I. or Cased-Glass

	Diam.	Depth	Fitter
No. 396 —	16″	10″	6″
No. 397 —	10″	10½″	6″
No. 398 —	12″	14″	6″

555 Series



Supplied in Cased-Glass, Sol-Lux, or etched design 167—Sepia

	Diam.	Depth	Fitter
No. 555 —	15¾″	8″	6″
No. 556 —	13″	8″	6″
No. 557 —	10″	8″	6″

550 Series



Crystal Enamelled

	Diam.	Depth	Fitter
No. 550 —	13″	8½″	6″
No. 551 —	15⅞″	11½″	6″

515 Series



Supplied in Cased-Glass, Sol-Lux, or etched design 166, as illustrated

	Diam.	Depth	Fitter
No. 515 —	10″	9¼″	6″
No. 516 —	14″	10″	6″
No. 517 —	12″	14″	6″

JEFFERSON GLASS CO.

Limited

Head Office and Factory:
388 Carlaw Avenue, - TORONTO

Prices to Electric Trade Only On Request

We Sell The Glassware Only



Exide
MADE IN CANADA
BATTERIES

The battery that lasts and *lasts* and *lasts*

The economy and the satisfaction of an electric power and light plant depend to a great extent on the battery. It is the heart of the system, and it needs a strong, efficient heart to give ungrudging service for years.

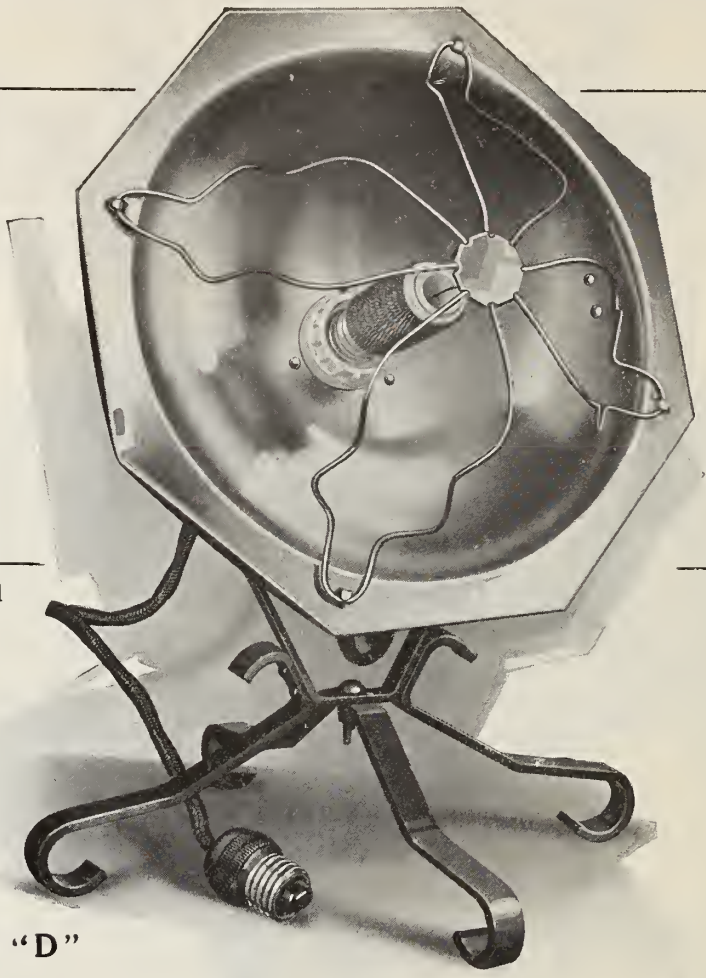
It is significant that three out of every four electric plants are equipped with batteries of Exide make. Nearly all the huge batteries in central power and lighting stations are Exides. The long-life Exides propel submarines under the sea and mine locomotives under the surface of the earth. They provide current for the telephone system and ring the city fire alarm.

Not only does the Exide last longer than ordinary batteries, but it is the battery of high efficiency, and it maintains its capacity. It is easy to care for and keep clean, and repair parts are always obtainable. Do not accept a substitute for an Exide—there is no adequate substitute.

EXIDE BATTERIES OF CANADA, LIMITED
153 DUFFERIN ST. TORONTO

Six Seventy-Five

a low price for loads of heat



Model "D"

$6.75

West of Ontario $7.00

H. E. P. C. Approval No 853

17½ Inches High

AT last the householder may procure a real electric heater at a very small investment.

The low price—$6.75—doesn't mean that this is a cheap, competitive specialty. Rather model "D" STAR-RITE Electric Heater is made by an organization equipped to produce this device in quantities sufficient to warrant a low selling price, but in a quality worthy of backing with a worthwhile guarantee.

For instance—note the new idea in our artistic andiron base! Then the 12-inch, pure copper reflector, octagon in shape. Its height is just right —17½ inches. The heating element is nickel-chromium and removable by screwing out.

And the demand?—it is created and kept growing by consistent advertising. Link up this demand with the low selling price and you have the makings of real profitable business.

BUT—place your orders with specified delivery date NOW—with your jobber. He'll keep his word on deliveries, too.

from your jobber

THE CANADIAN FITZGERALD MFG. CO.

95 KING STREET EAST TORONTO, ONT.

Star-Rite

Guaranteed

Heaters

[No More Cold Corners]

[NO MORE CHILLS]

WAFFLE IRONS TOASTERS HEATING PADS VIBRATORS VIOLET RAYS SEWING MOTORS

"Reel Service"

From Coast to Coast

Canada Wire & Cable Co. limited

Halifax Montreal Toronto Regina
Winnipeg Calgary Vancouver

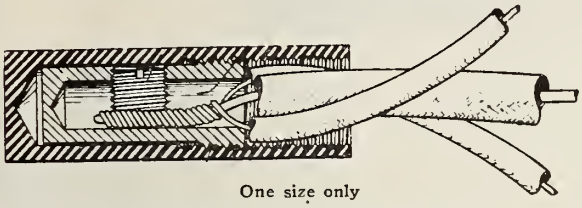


Get Our New Hand Book

This handy little book is full of valuable information for the electrical engineer, contractor, construction man, repair man, etc., and a copy will be gladly sent on application to our nearest branch. Write or phone for it today.

THE MARR

Insulated Wire Connector



One size only

Takes any fixture condition

Hydro Laboratory Approval No. 985

Underwriters Laboratory Approval No. 6038

EVERY CONNECTOR FULLY GUARANTEED

All danger from soldering entirely removed

PASTELESS SOLDERLESS TORCHLESS TAPELESS

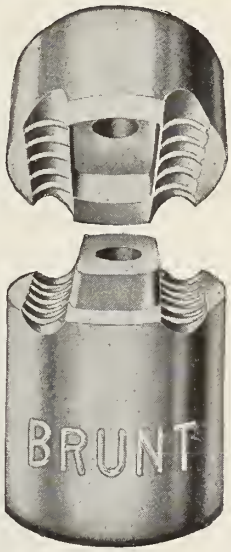
CLEANER NEATER QUICKER CHEAPER

Ask Your Jobber or Send for Sample

Sole Manufacturer

W. P. MARR 102 Russett Ave.
Toronto - Ont.

BRUNT



HIGHEST QUALITY

PORCELAIN

KNOBS
TUBES
CLEATS
AND
SPECIALTIES

CANADIAN REPRESENTATIVES

Duggan Import Sales Co.,
162 King Street, West,
Toronto, Ontario

Russell Fowler Co.,
306 Notre Dame Avenue,
Winnipeg, Man.

THE BRUNT PORCELAIN CO.
Columbus Ohio

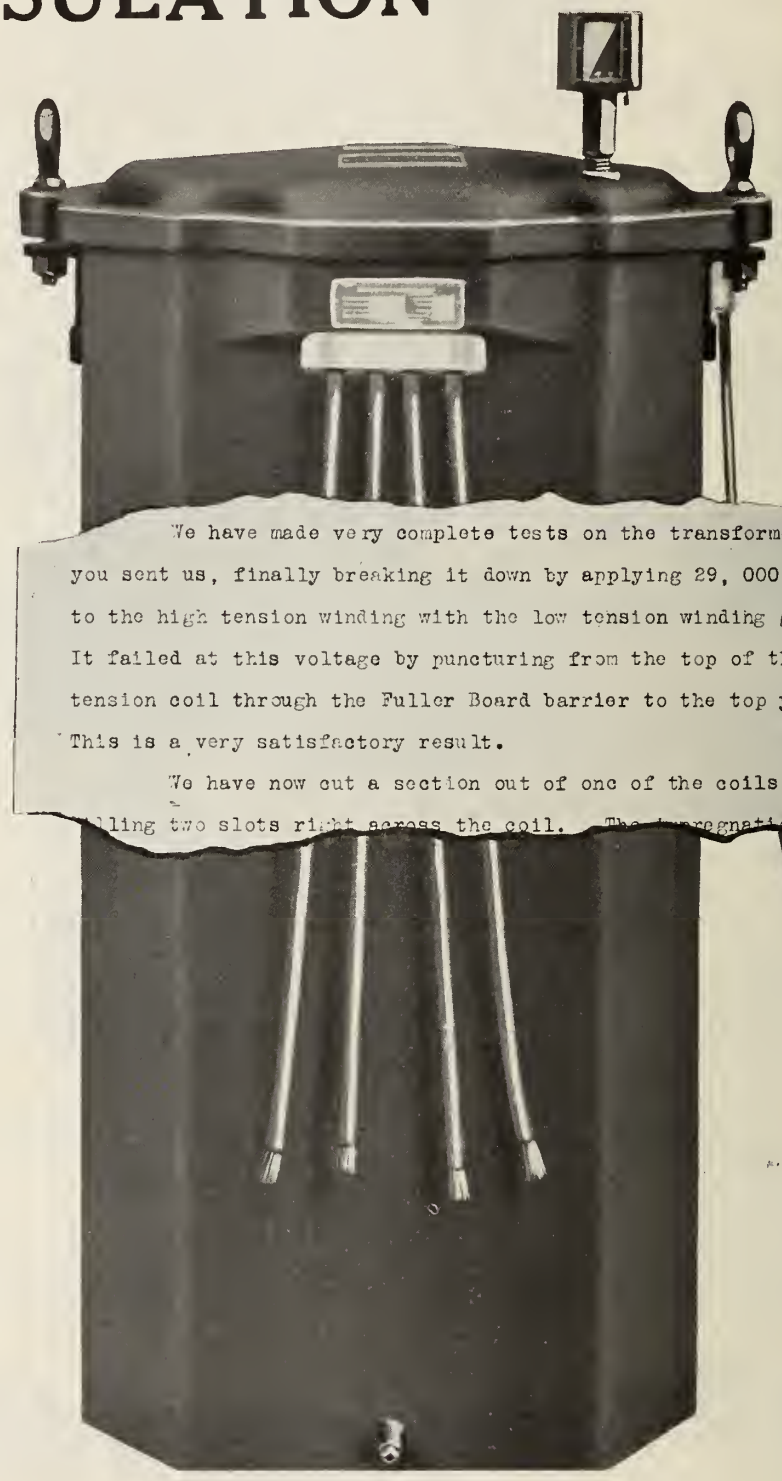
The Star Porcelain Company

TRENTON, N. J.

Manufacturers of Electrical Porcelain Specialties. Also specialize in the manufacture of heater bricks for electric ranges.

TRANSFORMER INSULATION

One of our standard 2200 volt, 10 KVA, pole type transformers recently shipped from stock, was subsequently tested to destruction by an outside Company.



We have made very complete tests on the transformer you sent us, finally breaking it down by applying 29, 000 volts to the high tension winding with the low tension winding grounded. It failed at this voltage by puncturing from the top of the high tension coil through the Fuller Board barrier to the top yoke. This is a very satisfactory result.

We have now cut a section out of one of the coils by ...lling two slots right across the coil. The impregnatio...

It failed at 29,000 volts.

But even at 29,000 volts on a 2,200 volt lighting transformer, it didn't fail between primary and secondary.

If you can buy better transformers, by all means buy them.

FERRANTI METER AND TRANSFORMER MANUFACTURING COMPANY LIMITED

Head Office and Factory TORONTO, CANADA

Westinghouse Type H-1 Range



The complete type H-1 Range

A small electric range just suited for apartments, kitchenettes and summer homes.

It is a neat, compact, quick and efficient cooker.

A high back warming shelf is furnished when desired.



Removing Oven Top Heater

Ask nearest office for Instruction Book No. 5005, it gives full information.



The Thermostat

Canadian Westinghouse Co., Limited, Hamilton, Ontario

TORONTO, Bank of Hamilton Bldg.
HALIFAX, 105 Hollis St.
CALGARY, Canada Life Bldg.
MONTREAL 285 Beaver Hall Hill
FT. WILLIAM, Cuthbertson Block
VANCOUVER, Bank of Ottawa Bldg.
WINNIPEG, 158 Portage Ave. E.
EDMONTON, 211 McLeod Bldg.
OTTAWA, Ahearn & Soper, Ltd.

MONTREAL, 512 William St.
WINNIPEG, 158 Portage Ave., E.

Repair Shops

VANCOUVER 1090 Mainland St.
TORONTO, 366 Adelaide St. W.
CALGARY, 320 8th Avenue West

CANADIAN WESTINGHOUSE

Westinghouse



What is your idea of a good transformer ?

IF you were having a transformer built to your own specifications, what would it be notable for? Its liberal design? Great insulation strength? High Efficiency? Rigid mechanical construction? Neat appearance? No doubt your transformer would embody all of these qualities — if so, it could fairly be called a good piece of equipment.

Moloney transformers are built to the above specifications, That is why they give such satisfactory service.

Moloney transformers are built in all sizes and voltages from the small distribution type to the larger power, and high voltage unit, either self or water cooled, for step up or step down service.

Moloney Electric Company
of Canada Limited

Factory and Head Office:

213-219 Sterling Rd., Toronto, Ont.
Branch Offices: Montreal, Halifax, Winnipeg

Agents:

General Supply Company, Calgary, Alta.
Frank Darling, Vancouver and Victoria, B.C.

Electrical
Mechanical
Chemical

Directory of Engineers
and Special Representatives

Testing
Research
Patents

Canadian Water-Powers Agency
(Registered)
CHARLES BRANDEIS, C.E., E.E.
Consulting Engineer
We negotiate sale and purchase of developed and undeveloped water-powers.
Estimates made on power available and costs of development.
390 Phillips Place, MONTREAL
Telephone Uptown 2825.

KERRY & CHACE, Limited
ENGINEERS
President: J. G. G. Kerry
Associates: A. L. Mudge, H. R. McClymont
A. T. C. McMaster, H. B. Proudfoot
Hydro Electric & Steam Power Developments, Steam & Electric Railways, Pulp & Paper Mills, Industrial Engineering.
Confederation Life Bldg., TORONTO

R. S. KELSCH
Consulting Engineer
Steam, Hydraulic, Electric,
Reports, Estimates, Arbitrations
Power Building, MONTREAL

Beaubien, Busfield & Company
Consulting Engineers
2 Place D'Armes
Montreal
De Gaspe Beaubien, B. Sc.
M.E.I.C., M.A.I.E.E
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Trade Marks and Designs
Procured in all Countries
Special attention given to
Patent Litigation
Pamphlets sent free on application
Ridout & Maybee
156 Yonge St. Toronto, Ont.

ALLEN ENGINEERING CO.
INSPECTION ENGINEERS
Inspection and Tests at
Manufacturers'
71 King St. West, Hamilton, Ont.

Electrical Testing
Laboratories
"Electrical, Photometrical and Physical Tests and Inspections".
80th Street and East End Avenue,
New York, N.Y., U.S.A.

Charles H. Mitchell
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Consulting and Supervising
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Hydraulic, Steam and Electrical Power Plants, Industrial and Municipal Engineering.
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M. A. SAMMETT
Consulting Electrical Engineer
Tests, Reports, Arbitrations
Supervision of Lighting and Power Plants
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505 McGill Bldg.
Montreal, P.Q.

GEO. L. GUY
Electrical Engineer
Plans, Specifications and Estimate
Reports, Arbitrations and Valuations
Tribune Bldg. WINNIPEG

PATENTS
HERBERT J. S. DENNISON
Mechanical Engineer and
Registered Attorney
Expert in Patents, Trade Marks, Design Copyrights and Infringements. 20 Years' Experience in Patents and Practical Engineering
Federal Building,
Richmond and Sheppard TORONTO

This Space is Available

!

This two color attractive space is available from our issue of September 1st onwards at a cost of only $60.00 per inch, per year of 24 issues reaching 3,500 electrical men throughout Canada. The above firms whose cards are shown find this small space especially valuable and many of them have been with us for years.

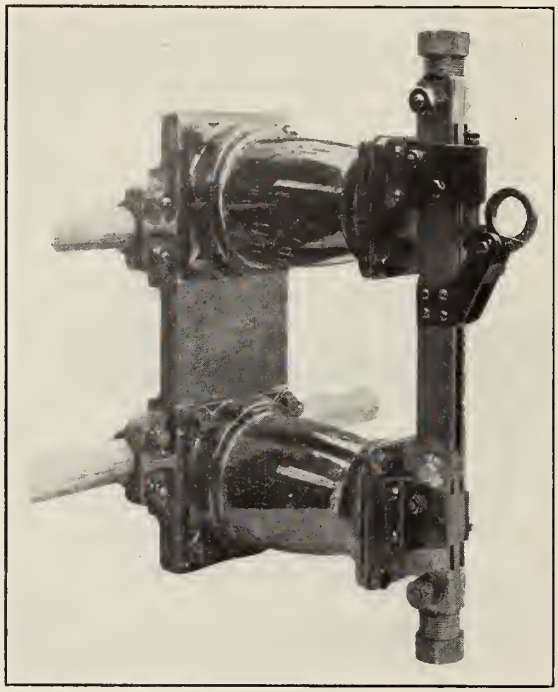
Write to-day!

Electrical News
349 Adelaide Street West, Toronto

FERGUSON, PAILIN LTD.

Canadian Office and Warehouse:

321 KING STREET EAST, TORONTO, ONT.



A Reliable Disconnect

HEAVY DUTY DISCONNECTS, as supplied to the Hydro Power Commission of Ontario comprising:-

1. Jig assembled interchangeable Porcelain units—the same units are also applied for bus bar supports.
2. Substantial Locks.
3. Large eye release for pole operation.
4. Straight through contact jaws—**joints and right angle bends eliminated.**

   Note: With the omission of the right angle bends, the heavy magnetic field is eliminated when under short circuit conditions.
5. Substantial case base for pipe or wall mounting, resisting distortion when bolting up to an uneven surface.

Enquiries Solicited.

FERGUSON, PAILIN LTD.

Manager:

HERMAN K. ANSINGH

Columbia Data Sheet Service is at your Command

WHERE correct Columbia Pyramid Brushes are used the commutator is quiet, cool and smooth-running. Let us co-operate. Columbia Data Sheet Service selects the brushes which are *exactly right* for each individual generator or motor. The service is available to all, and is free—whether your brush-equipped units number one or a thousand.

Columbia Pyramid Brushes are uniform in size, structure, capacity and performance. Once tried they are always continued.

CANADIAN NATIONAL CARBON CO.
Limited
MONTREAL TORONTO WINNIPEG

C N C
Look for this Mark on your Brushes

MG6

NUMBER 6

This is the sixth of a series of ten advertisements

The Line that R. and I. E. Co. Builds!

This is the — Base—Steel Channel

That supports the — R. & I. E. Interchangeable Insulator Units with Forged Steel Pins and Pressed Steel Caps. No clamps, no screws

That carries the — Clamp Terminals, Bronze Fuse Supports and Arcing Horns

That holds the — Glass Cartridge Fuse—Protects Fuse Wire and makes Re-fusing easy

That makes up the — Interchangeable Unit Fuse Holder. Standardized parts, competently designed and carefully made, insure interchangeability

Interchangeable Unit Fuse Holder and Fuse that R. and I. E. Co. Builds

R. & I. E. Interchangeable Insulator Unit Equipment for outdoor service includes Bus Supports, Disconnecting Switches, Air Break Horn Gap Switches, Choke Coils, Fuse Holders, Lightning Arresters, Substation Combinations and Outdoor Steel Substations.

Manufactured by
Railway and Industrial Engineering Co.
Greensburg, Penna.

6



Street Lighting Equipment

New Designs using Holophane Glass

We also solicit your enquiries for the products of
Weston Electrical Instrument Co.
The Bristol Co.
Metric Metal Co.
Albert & J. M. Anderson Mfg. Co.
Philadelphia Electrical & Mfg. Co.
Railway & Industrial Engineering Co.
General Devices & Fittings Co.
G & W Electric Specialty Co.

Powerlite Devices, Limited

Successors to
A. H. Winter Joyner Limited,
62 Front St. West, TORONTO
New Birks Bldg., MONTREAL



Newly Awakened Canadian Demand for Audio Frequency Transformers

The remarkable increase in inquiries from Canadian readers of our advertisements in radio and mechanical magazines indicates that Canada is hungry for better audio frequency amplification.

Canadian Wholesalers and Retailers will do well to take immediate advantage of this urgent newly-awakened demand, by laying in a suitable stock of

"United" Audio-Frequency Amplifying Transformers

These instruments have been found to meet Canadian conditions, fully; especially in overcoming the weakness of detected signals due to the great distance which must be migrated by so many Canadian radio enthusiasts.

The whole trend of recent radio improvement and development throws increasing stress on *audio* frequency.

We desire to discuss this important matter in detail with Canadian Distributors.

United Mfg. & Distributing Co.
9705 Cottage Grove Ave., Chicago, Illinois

New York Office: 50 Church Street, New York, N. Y.
San Francisco Office: 705 Mission Street, San Francisco, Cal.

Interior Telephones

for

Apartment House, Factory, School, Hospital, Office

Electric Reset Annunciators and Signal Specialties

Hospital Signal System

A complete new silent call system for hospitals. Registers at nurses' quarters and office with time record, if wanted.

Canadian Factory Representatives:

Cochrane, Stephenson & Co. Ltd.
265 Portage Ave.
Winnipeg, Man.

Cochrane, Stephenson & Co. Ltd.,
850 Hastings St.
Vancouver, B.C.

Timberlake & Bourne
New Birks Bldg.,
Montreal, Quebec

The Pierce Electric Company,
104 Richmond St. West,
Toronto, Ontario

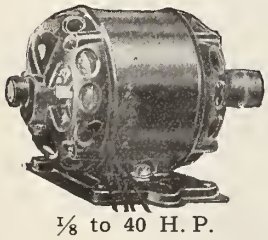
CONNECTICUT TELEPHONE & ELECTRIC COMPANY
MERIDEN CONNECTICUT

Century

Repulsion Start Induction

Single Phase Motors

develop a heavy Starting Torque



⅛ to 40 H. P.

with a low starting current. A fuse which will protect the motor while running is usually of ample capacity for starting, due to the low starting current and quick acceleration.

Temperature Rise not over 40° Centigrade

CENTURY ELECTRIC CO.

1827 Pine Street ST. LOUIS, Mo., U.S.A.

Stock carried in Canada by:
Jones & Moore Electric Co. Ltd., 294 Adelaide St. W., Toronto
Great West Electric Co. Ltd., Winnipeg
Rudel-Belnap Machinery Co. Ltd., Canadian Express Bldg., Montreal
Rankin & Cherrill, 55 Hastings St. W., Vancouver, B.C.

KLITZEN

REGENERATIVE—

Receiving Sets

Real Radio Simplicity

Only one adjustment

Licensed under Armstrong Patents

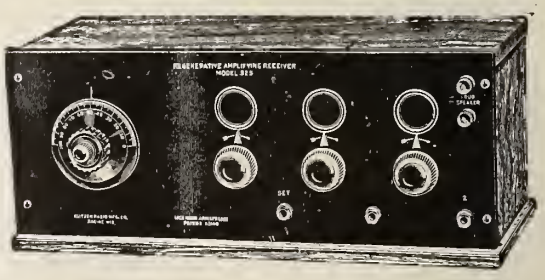
The principal feature of No. 525 Regenerative Tuner Detector, 2-stage audio amplifier is SIMPLICITY.

Any operator can get wonderful results because there is only one adjustment. Receiving Range practically the same as that of the best radiophone equipment on the market.

Each unit carefully tested before shipment. The best material and most highly skilled workmanship employed—it is the product of experts who have been making radio equipment since 1913.

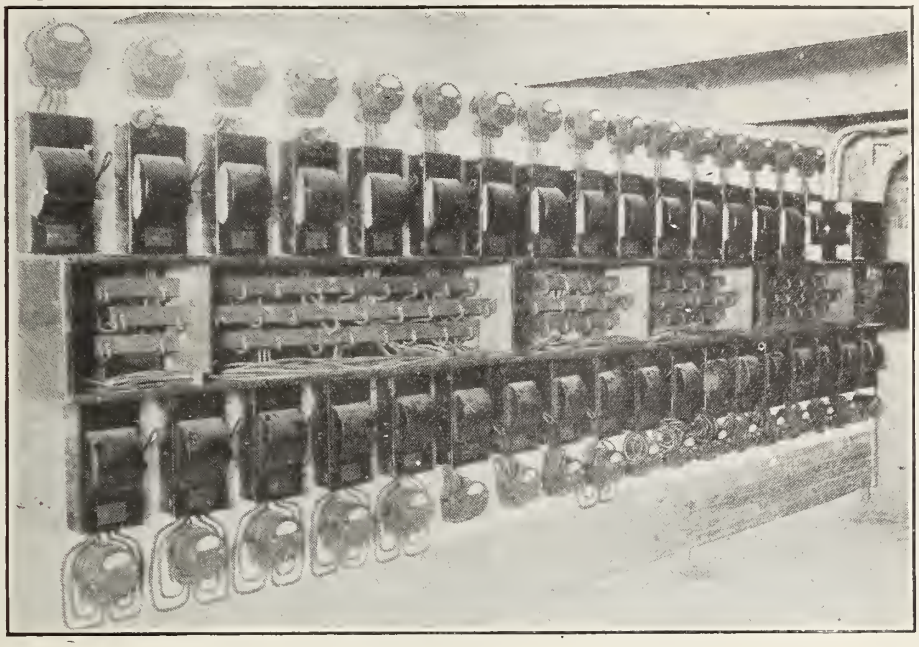
JOBBERS AND DISTRIBUTORS. Write for full information and big discounts. DEALERS—ask your jobber or write us.

KLITZEN RADIO MFG. CO., Inc.
Racine, Wis.



MODEL No. 525

LIST PRICE **$80.00**



The Finest Distributing Board of its Type in Canada

This board was recently designed and built by Canadian Drill & Electric Box Company and installed by Messrs. Roxborough-Dean Ltd., in the Buckingham Apartments, Sunnyside, Toronto. Experts agree it is one of the finest installations which has been constructed in this class of work. It shows the service we are prepared to give the Canadian contractor and the folly of going outside our own country for electrical equipment.

Like all "Canadian Drill" products, it is Canadian clear through. We are a Canadian firm, using Canadian capital and labor, and all our products are "made" not merely "assembled", in Canada.

For further particulars see page 58

CANADIAN DRILL & ELECTRIC BOX

1402 Queen St. East, Toronto Ontario

Phone Gerrard 0554

EBY BINDING POSTS INCREASE THE VALUE

of your equipment by increased efficiency and neater appearance.

They eliminate Poor Connections, Damaged Terminals, and Lost Parts. They have larger Contact Surfaces.

Standard Equipment by Leading Manufacturers.

Sold by leading Radio Dealers.



Distributed By—THE WALLACE BARNES CO., LTD. - - HAMILTON, ONT.

Chromel
MARSH ALLOYS

Stands the Heat



It won't scale off. It stands high temperatures better than any other alloy known. It is made in all sizes for Electrical Heating devices. Can you use an element like this?

Write for full particulars.

MADE IN CANADA

HIRAM WALKER & SONS METAL PRODUCTS, LIMITED

WALKERVILLE, ONTARIO.

Canadian Armature Works

St. Catharines, Ontario, Canada

Night phone: 1496 Day phone: 223

Electrical Repairs Power Installations

Manufacturers

Motors Commutators Transformers

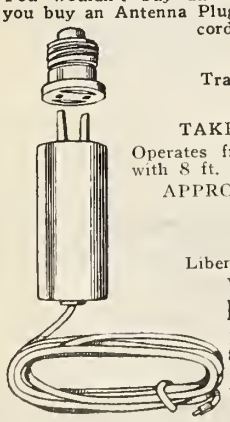
Coils for railway equipment

Armatures rewound, any type of coil manufactured

Write us for prices on Motors, Coils and Repairs

Let us figure on your requirements

You wouldn't buy an automobile without a self starter. When you buy an Antenna Plug insist on one complete with a handsome cord. Buy the original.



Trade "NO AERIAL RAD-O-PLUG" Mark

TAKES THE PLACE OF AN AERIAL

Operates from any electric light socket. Complete with 8 ft. cord.

APPROVED BY NATIONAL BOARD OF FIRE UNDERWRITERS

PRICE $2.50

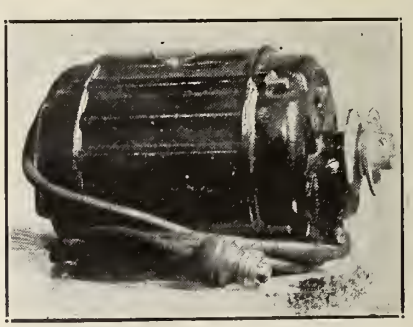
Liberal discounts to jobbers and dealers

Write for circulars Agencies Open

Radio Products Corporation

Manufacturers 8926 Clarendon Ave., Distributors Detroit, Mich.

Representative for Western Canada: F. E. Garrett & Co., 607 Union Trust Bldg. Winnipeg, Man.



EXTRA!

¼ Horse MOTORS $18 00

Without doubt we have the greatest buy in Washing Machine Motors on the Continent. Made under our supervision and fully guaranteed by us for 1 year.

SPECIFICATIONS: ¼ H.P. 110 V. 25 Cy.

All single phase. Prices F.O.B. London. No tax.

LEFF ELECTRIC COMPANY

316 Grey St., LONDON, ONT.

AT THE CANADIAN NATIONAL EXHIBITION

Electricity at the Canadian National Exhibition

Electricity dominated the exhibition. There can be no doubt about that. Light, power, heat, telephone, radio. Remove these manifestations of electric energy and what is left?

And did you notice the changing attitude of the public towards electrical appliances? A few years ago they were all incredulity and ignorance. Today they are interested, informed, convinced and often enthusiastic. Housewives who five years ago looked upon electrical appliances somewhat as curiosities, certainly as luxuries, now discuss with the salesman the merits of this or that toaster, range or washer. One frequently heard the remark "Yes, I have a so and so."

The electrical display was a splendid success, considering the unsatisfactory building and its out-of-the-way location. The public will never get a proper perspective of the industry, however, until the new building is occupied. The idea of an Electrical Building is being steadily pushed forward and next year should see construction well along. It will be worthy of the industry it is to represent and will occupy a dominating position at the main entrance to the grounds. Considering that almost one quarter of the population of Canada visits this exhibition each year—all looking for information—the value of such an impression as this new building must inevitably create, cannot easily be overestimated.

In spite of limited accommodation, many of the electrical exhibits were centres of throngs of interested visitors from early morning till late at night throughout the entire two weeks. The Canadian General Electric Company's demonstration of lamp manufacture was an outstanding example. This, with other valuable exhibits, is described in more detail in the following pages. These illustrations are typical and give one a vision of what exhibition visitors of the near future will see concentrated in one new Electrical Building.

AT THE CANADIAN NATIONAL EXHIBITION

Radio a Feature Among Quality Products of Northern Electric Co.



Such a comprehensive line is carried by the Northern Electric Company as to require a careful study of arrangement, that the various articles may be grouped so as to give each a suitable amount of display. In this year's exhibit at the Canadian National Exhibition, which was placed in Booth 56 of the Industrial Building, it was evident that this idea has been followed.

At the right hand side of the booth was placed an arrangement of material that proved a magnet for a stream of visitors. Timeliness, attractiveness and reputation made the radio exhibit of the Northern Electric Company a centre of interest to thousands of enthusiastic fans. The complete line was shown, and shown to be complete. Dealers were especially interested in the display of vacuum tubes, of which no less than 13 lines were on display for this fall's buying. From all indications, radio business will be brisk this autumn, and dealers are turning in large numbers to the Northern Electric Company for reliable apparatus. A feature of the exhibition display was a duplicate of the set presented to the Christie Street Military Hosipital, Toronto, by J. J. Gibbons.

The Gurney electric range was represented by two fine examples in the Northern Electric Company booth. These produced numerous enquiries, which indicated a strong interest in electric cooking.

Another feature of the Northern Electric display was the showing of P A X and P B X apparatus. Telephone equipment of the highest order was exhibited, and the fact that it is manufactured by a Canadian company, elicited much favorable comment.

The established slogan of the Northern Electric Company, "Quality Electrical Merchandise," is maintained by this showing at the Canadian National Exhibition. The goods it sells carry trademarks indicating quality products of established standing in the electrical field.

Northern Electric Company, Limited

Head Office: Montreal

AT THE CANADIAN NATIONAL EXHIBITION

New National Electric Range Hits the Bullseye



A firm that continually uses 600 feet of floor space at the Canadian National Exhibition for its exhibits, evidently must have something worth showing. That is the case with the National Electric Heating Company. They have occupied the same stand for ten years, and find that interest in their exhibits increases every year. The photograph shows their comprehensive line as shown in Booths 46, 47, 48, 49, Industrial Building, Canadian National Exhibition. Some idea of the extent of this firm's manufacture may be gathered from the fact that there were on display eleven different styles of ranges, featuring the new range with the new burner, a new line of flush and portable grates, water heaters, and besides, a full showing of appliances.

The large and growing preference for "National" products is due in part to this exhibit. An observer who stationed himself near this interesting stand, could not fail to note its drawing power. Dealers, central station men, agency men, consumers—all made an investigation of the National line, and such interest augurs well for the coming season. Attention centred on the new burner. The fact that it plugs into the receptacle, and is so easy to clean, was a revelation to many, who were obviously impressed by this strong feature.

There were many indications that this year will be a banner one for electric heating appliances. Interest was never so keen in regard to portable and grate heaters, and this combined with the confidence with which dealers and consumers regard the guaranteed "National" line, leads to a confident prediction that dealers will be able to place the "National" goods with little difficulty.

Many dealers who visited the exhibit, testified as to the lasting qualities of the National line, and to their satisfaction with the backing which this company gives the dealer.

The National Electric Heating Co. Limited

Head Office: Toronto

AT THE CANADIAN NATIONAL EXHIBITION

Sunnysuds Goes Over in a Big Way To Thousands of Spectators



Manufacturers' Building No. 2, contained a booth that explains why the Sunnysuds Washer and the Eureka Vacuum Cleaner stand high in their respective fields. This display, staged by the Onward Manufacturing Company and the Eureka Vacuum Cleaner Co., was at all times a centre of interest. Housewives gathered there to see and have explained to them how to do their housework in ways that would save the illness and worry deemed necessary to such toil a few years ago. A steady arrival of electrical dealers was also noted. These came to brush up on points of demonstration or to endeavor to secure agencies for these popular appliances.

The secret of the popularity of the Sunnysuds Washer was explained by the demonstrations. Its appearance is a strong point. Every woman is naturally attracted to a handsome looking appliance, and in this department Sunnysuds ranks second to none. Its strength and endurance is another good quality—an all-metal machine that will stand up under all kinds of hard work. Ease of operation, safety features, a safety switch which automatically prevents over-loading, were all points that were noted with interest. An actual demonstration was carried on, and many housewives were heard to comment on the thoroughness of the work.

Another "life-saver" was exhibited in the shape of the Eureka Vacuum Cleaner. A handsome, light, well-constructed machine, easy on the carpets, easy to operate, a necessity to any home, were a few of the reasons why this cleaner went over in a big way.

Progressiveness is associated with the name of the Onward Manufacturing Company and the Eureka Vacuum Cleaner Co. Liberal dealer policies and substantial fair priced products are reasons why these appliances are popular with dealers and consumers alike, and why their exhibition display is always a centre of attraction.

Onward Manufacturing Company

Kitchener, Ont.

AT THE CANADIAN NATIONAL EXHIBITION

"Canadian Beauty" and "Majestic" Are Magic-Working Names



The favorable regard in which the Renfrew Electric Products lines are held by dealers and consumers alike, was amply demonstrated by events during the two weeks of the Canadian National Exhibition. Enquiries and orders, tangible signs of interest, poured in, proving that the display (Booth 30 in the Electrical Building) was in a good position, and well arranged.

The full line manufactured by Renfrew Electric Products, Limited, was shown. The booth was very prettily decorated, as is evidenced by the accompanying photograph. The color scheme and setting of appliances might well serve as a guide for window or store arrangement.

Majestic Sun Heat electric grates were a strong feature of the display. Their handsome appearance and satisfactory operation were much commented on, and promise a strong dealer and consumer demand. Dealers were especially interested in the air heater exhibition. For one thing they were all anxious to see the "Little Canadian Beauty," a new type selling at $6.75. This heater promises to be a winner. The other numbers, single and double coil, Nos. 7 and 8, of the Majestic Line, also got their share of attention. Many dealers are working for the premiums being offered by Renfrew Electric Pro-ducts, for heater sales, and are planning their windows for "Majestic Week," September 10 to 17, when prizes will be given for the best window displays.

Two attractive little booklets describing appliances were distributed, one "The Secret of Delightful New Dishes" and the other "Where is Mother at Meal Time?" The appliances described in the booklets were right there in the display for the reader to see, and waffle irons, hot plates, toasters, grills, percolators, table stoves and irons all came in for a due share of attention.

The whole Renfrew Electric Products Exhibit was a testimony to the high quality and popularity of the "Canadian Beauty" and "Majestic" lines. It gave the observer some slight idea of the extent of the organization which today is making records in the production of electrical goods.

Renfrew Electric Products, Limited

Toronto **Renfrew**

AT THE CANADIAN
NATIONAL EXHIBITION

Thousands Gaze at Pioneer Exhibit of Electric Lamp Manufacture



Tens of thousands of spectators gathered daily to see the exhibit of the Canadian General Electric Company in the Process Building at the Canadian National Exhibition. They stared wide-eyed at a display which marked the turning of a page of industrial history, the first public exhibition ever made of modern, almost entirely automatic, methods of manufacturing electric incandescent lamps.

The display was a factory in miniature, reproducing in almost exact detail the processes employed in making mill type lamps at the Sunbeam Lamp Works of the Canadian General Electric Company on Dufferin Street, Toronto.

At the extreme western end of the display was shown the automatic flange making machine which measures and cuts off the flanges from the raw tubing. These then passed to the stem machine, where the welds and exhaust tubes were put together, the machine automatically making the stem, at the same time embossing the wattage and voltage. The stems were then annealed, passing to the hook inserting machine, where the button is also made. Then followed the putting in place of the filament, flashing in a hydrogen bottle, a coating of "getter," and the sealing of the bulb. The machine next in order was a marvel of ingenuity, taking the bulbs and automatically evacuating them. They were then sealed and tipped off, and passed to the flash "ageing" machine, when the "getter" removed any trace of gas remaining. The bulbs were then based, terminal wires soldered, and passed to a final inspection, where they were lit and tested under a 20 per cent overload. Cleaning, labelling and packing followed as a preliminary to shipping.

Here then, were 8 automatic machines, requiring only to be loaded and unloaded, performing tasks which were all hand processes less than five years ago. A striking evidence of the Canadian General Electric Company's progressive methods!

The fact that all the lamps sold by this company are made by these means, and that the process has been thrown open to public inspection, is sufficient guarantee of the fact that the makers are proud of their product, and of their methods of manufacture. The display links up in the public mind, the name of the Canadian General Electric Company with the manufacture of high quality electric lamps.

Canadian General Electric Company Limited

Head Office: Toronto

AT THE CANADIAN NATIONAL EXHIBITION

Demonstrating an Electric Stove "With a thousand uses"



Dealers and consumers alike were interested in the display of the "Triplex" Portable Heater and Stove, at Booth 6, Industrial Building, Canadian National Exhibition. This testimony to the attractiveness of the "Triplex" is the more striking, when it is recalled that this heater has been but recently introduced on the Canadian market. Its handsome appearance, plus the way in which it was demonstrated, plus the indefinable "something" that had been put into the arrangement of the booth, served to make it stand out as an attention getter. The photograph above gives an idea of the general arrangement.

A visitor at the booth found either G. N. Comeau, who is handling the Montreal business for this firm, or A. S. Johnston, the Toronto representative, of 105 Langley Avenue, in attendance. London, Ont., dealers were informed that the wholesale distributors for that district are Messrs. Benson & Wilcox.

A point brought out in the demonstrations was the fact that the "Triplex" Portable Heater and Stove lives up to its name. It combines in a single unit, a sturdy, two-burner electric stove of great cooking efficiency and a neat, portable, hot-blast heater. Mrs. Johnston very ably acted as demonstrator, pointing out the various possible positions of the stove, showing that the "Triplex" may be used for toasting, boiling and baking; for heating wherever desired as in bedroom, bath-room, or garage, and that in fact, it is a stove of a thousand uses.

The "Triplex" is entirely Canadian-made under Canadian patents by a Canadian firm. It has been proved by the Ontario Hydro-electric Power Commission. Everything has been done to make it a safe, sanitary addition to the home. At the present moment the rush of orders has overtaken production, but it is hoped soon to cope with this condition by increased output.

Triplex Electric Manufacturing Company

653 St. Paul St. West, Montreal **105 Langley Ave. Toronto**

AT THE CANADIAN
NATIONAL EXHIBITION

Where a Rugged Element Counts—Sepco Automatic Electric Heaters



Pictured above is the booth in which Sepco Automatic Electric Heaters were exhibited at the Canadian National Exhibition. The photograph indicates that the exhibit accomplished the purpose for which it was designed—the driving home of the fact that Sepco automatic electric heaters are available on the Canadian market, and that their sturdy, enduring construction makes them a desirable investment. Many dealers visited this booth, and noted the high tide of consumer interest with great satisfaction.

The working of the automatic heater was well shown by a special demonstrating unit, shown on the table. This consisted of an element enclosed in a glass tube. The automatic feature was included as in a usual installation, and in addition there was a pilot light on the side. Control was adjusted to keep the water boiling, and everybody could see that the water circulates through the centre of the element, keeping the temperature down. The rugged construction of the element attracted much attention—copper clad, hollow(heats quicker and keeps a lower temperature than any other), with resistance wire entirely sealed, it was apparent that there was no oxidation, and scaling was impossible. Hence the life of such a unit stretches out indefinitely.

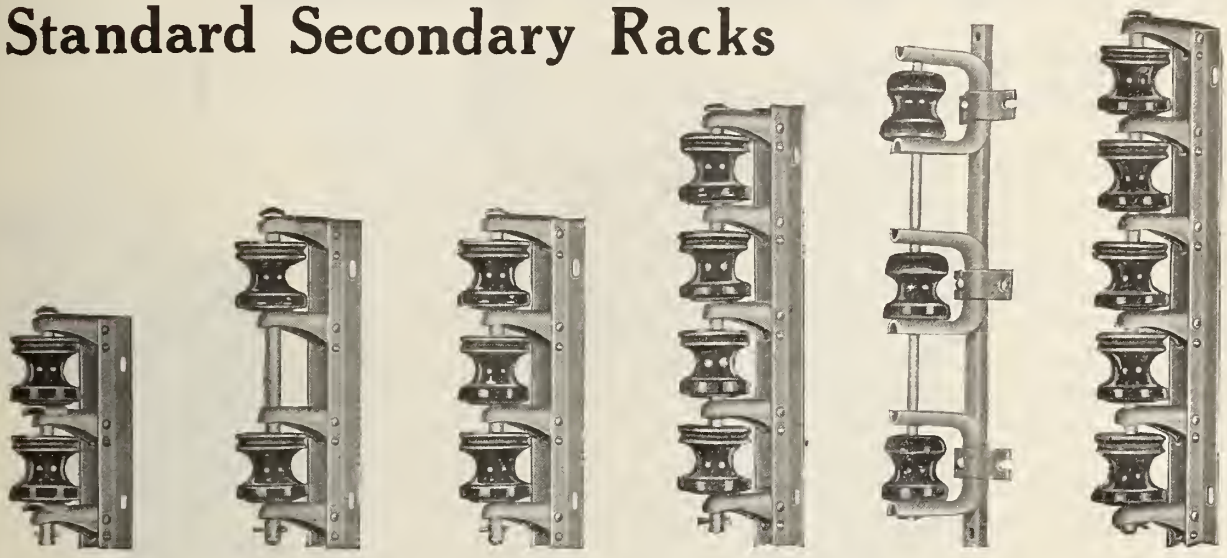
Other features of the Sepco display included a non-automatic unit, with double pole switch, semi-steel castings, and the usual element at $36.00, doctor's and dentist's types of small capacity operating from lamp sockets, the Sepco Automatic Glue Pot, a storage battery steamer (electrically heated) for taking off tops, a stamp vulcanizer for rubber stamps, and a self contained, storage automatic system for the ordinary house, taking the place of the gas heater. The same unit may be used for barber shops.

Dealers who visited the display were impressed with the ruggedness and low price of the Sepco system. Several contracts were closed, still further reducing the amount of open territory. The policy of the company is to have one good dealer to a town.

Sepco Automatic Heaters, Limited Toronto, Ont.

The Peirce

Standard Secondary Racks



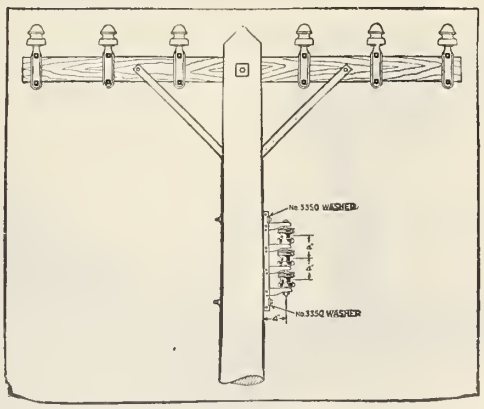
THE Peirce heavy pre-steel secondary racks are made so that the point of fastening is in direct line with the strain, developing the full strength of the metal.

This principle has been carried out as far as possible in all Peirce Specialties.

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Ask your jobber



Showing the 1250-Line Peirce Rack

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Hamilton, Canada

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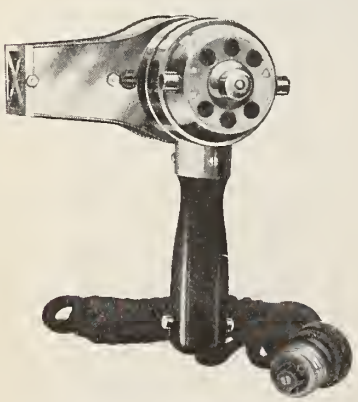
The name "Polar Cub" on electrical merchandise is becoming better known every day the world over. The pioneer in the small electric fan field, its growth has been phenomenal until today it leads all others in low priced, high grade electrical utility items.

Remember, in offering Polar Cub Products to your trade, you are not only opening the way to splendid profits to yourself but you are presenting electrical items that have been tried and found practical—items at popular prices, at the same time high in quality and backed by an unquestioned guarantee.

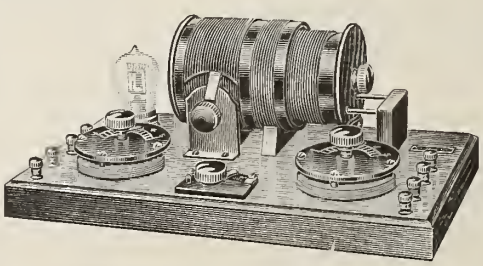


B90 New Polar Cub Heater, Retails $7.50

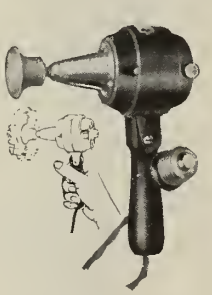
Send for complete catalog and prices.



B92 Polar Cub Hair Dryer, Retails $14.50



Gilbert's 4019 Radio Receiving Set, Range about 400 to 700 Miles, Retails $35.00



B87 Vibrator, Retails $7.50



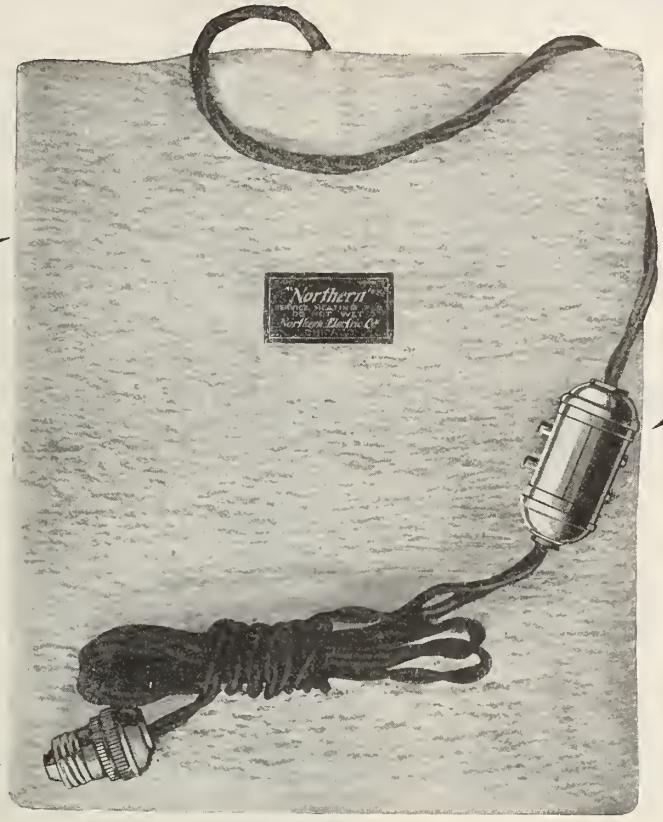
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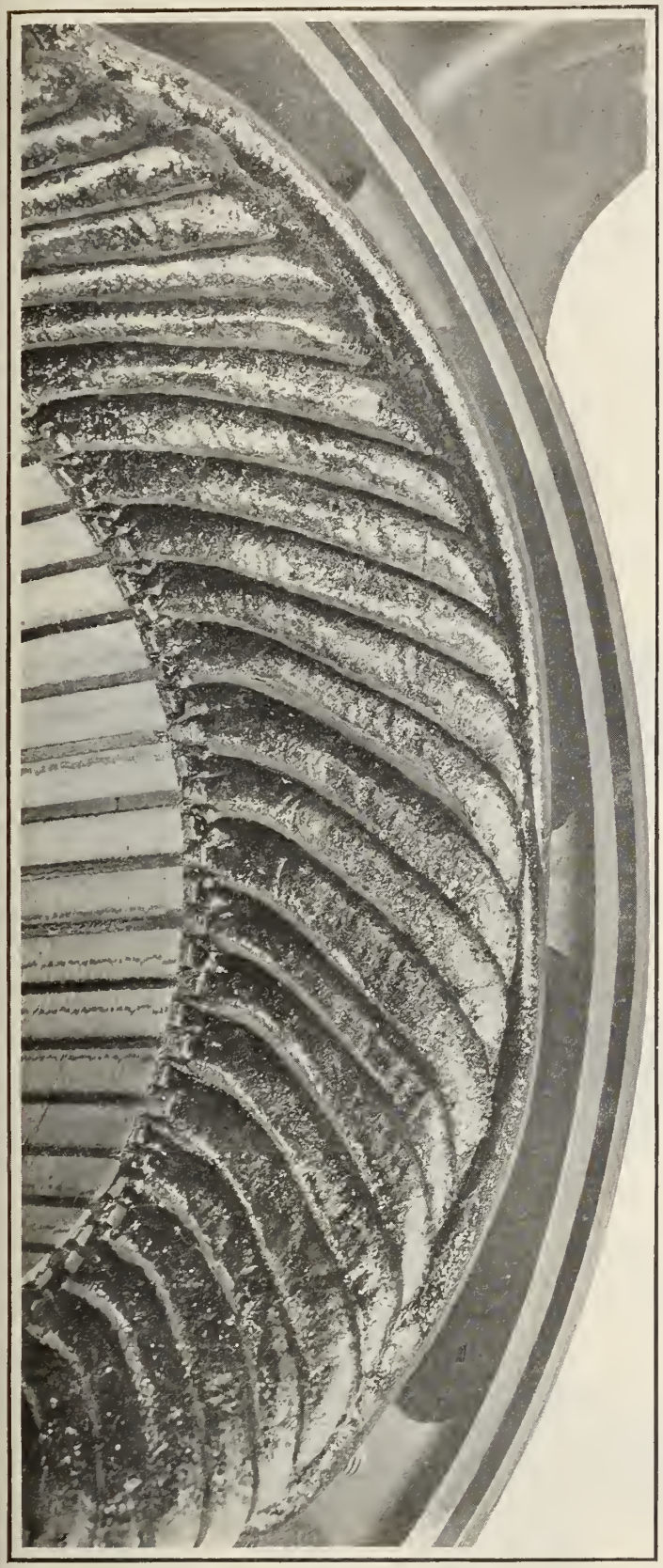
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IN the first place, the insulation is of the best heat-resisting quality.

And in the second place, the motor does not get hot.

Excessive heat is the chief agent in destroying the insulation of ordinary motors.

But the Wagner Pow-R-full Motor is no ordinary motor.

Every current-carrying part is constantly bathed in a scientifically directed air-current of ample volume to carry away excess heat.

That is why all excess weight and bulk are done away with in the Wagner Pow-R-full Motor.

That is why a Wagner Pow-R-full Motor means better service—less trouble—longer life.

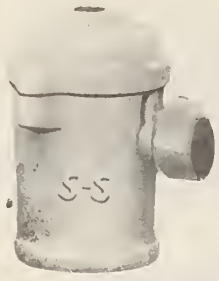
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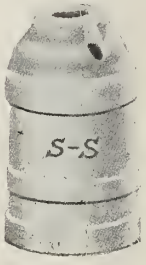
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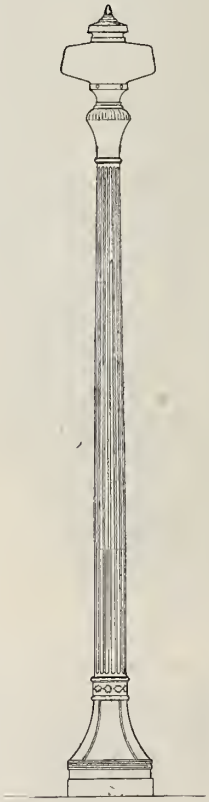


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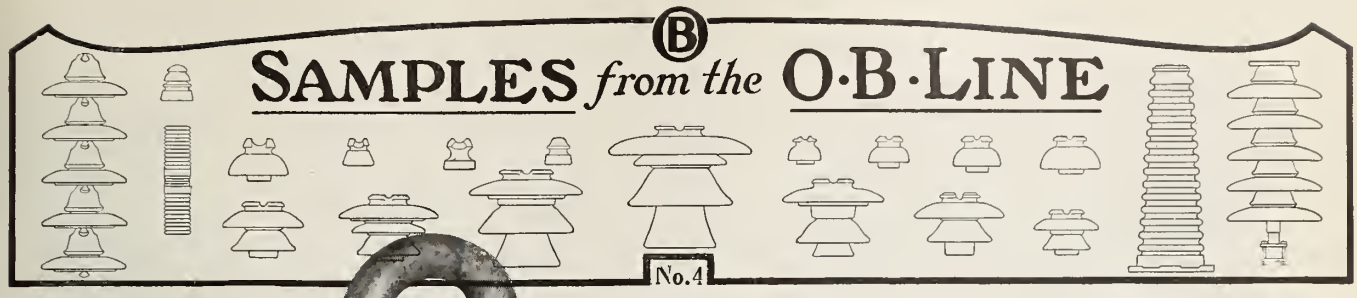
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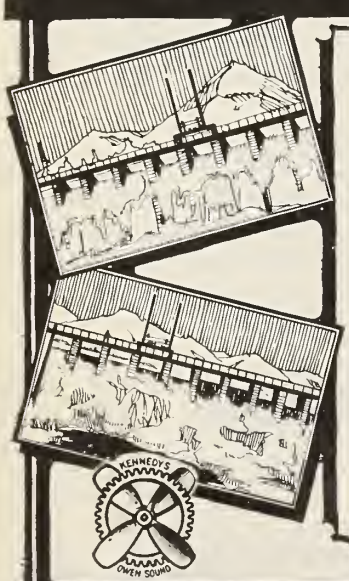
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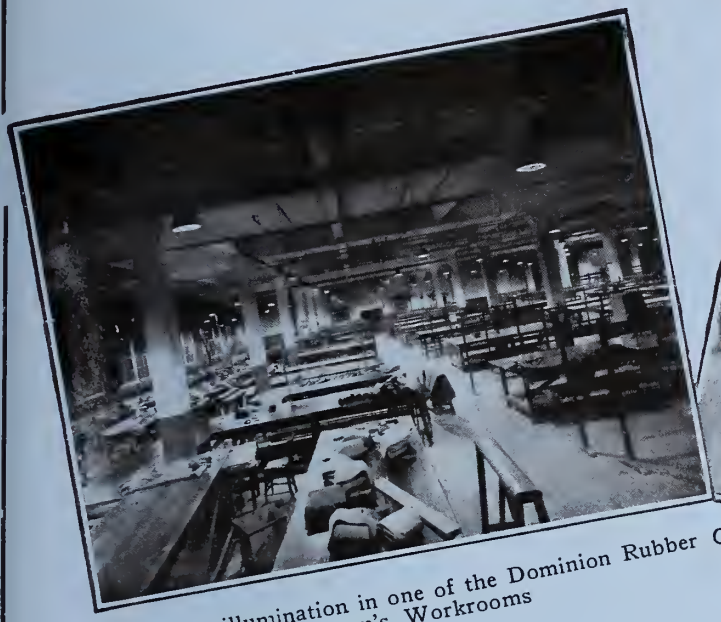
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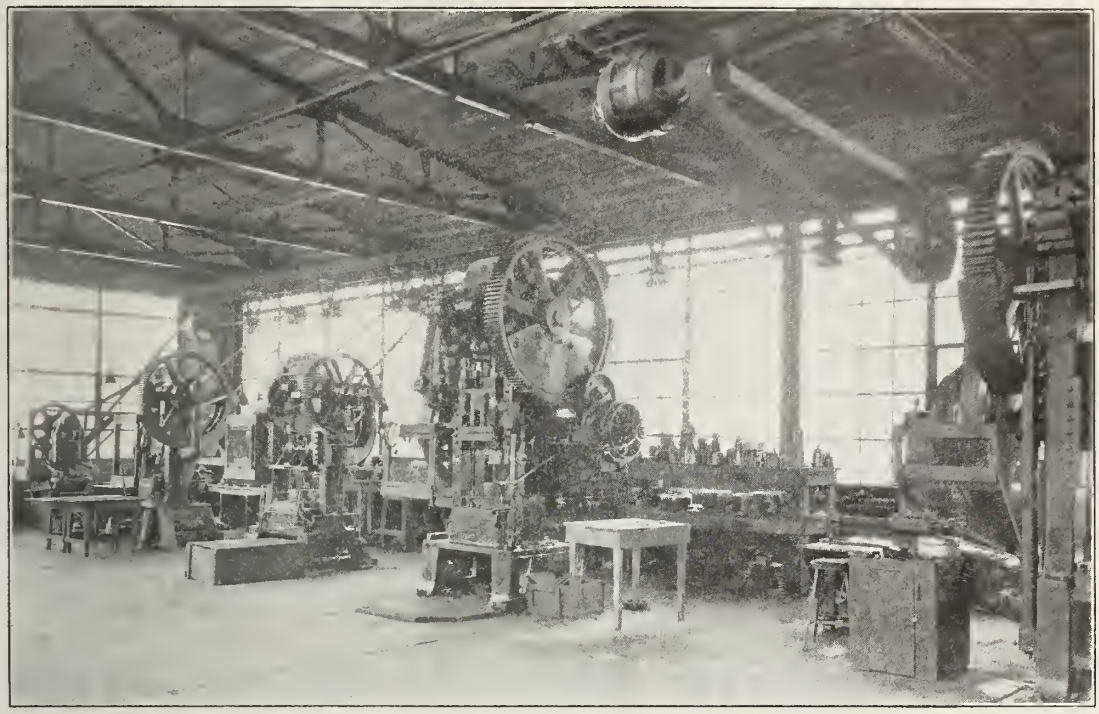
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R&M Motors are made in sizes from 1/50 to 150 Hp.

The Robbins & Myers Company of Canada, Limited

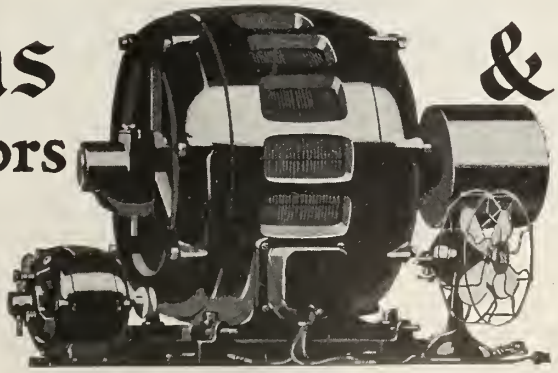
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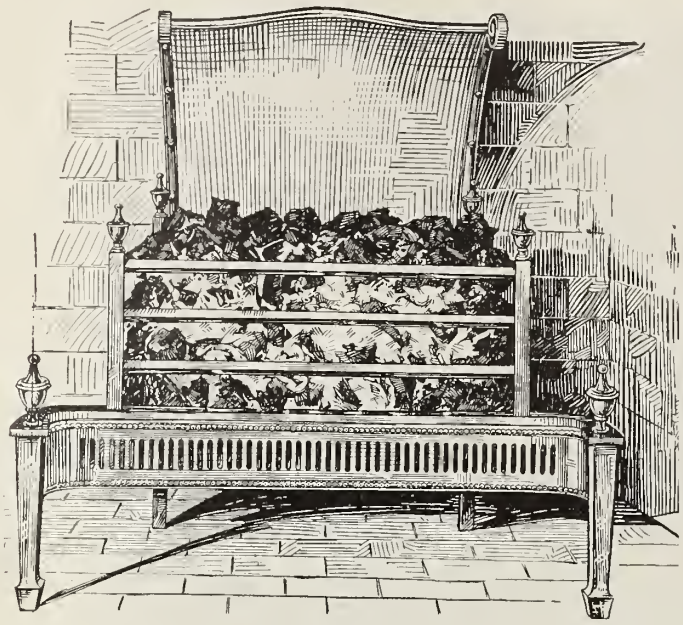
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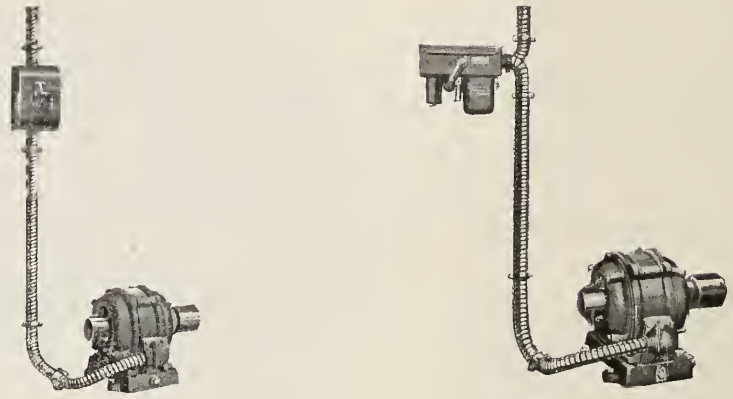
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To use anything but Tristeel on jobs like the above or on the hundred and one similar jobs for which Tristeel is especially designed is to sacrifice both efficiency and appearance.

Send a trial order and test it out. Sizes 5/16″ to 2″ carried in stock.

Immediate delivery guaranteed

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Conduits Company Limited

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Western Agents

COCHRANE STEPHENSON CO.

WINNIPEG - VANCOUVER



The Live Ones are Cashing In on the Coal Scare

When Everybody is Worrying About Their Winter's Fuel, Is the Time to Sell Electric Heaters—Get After the Business in Your Neighborhood With Timely Advertising and Snappy Window Displays.

Why shouldn't you take advantage of the situation? The scareheads which we reproduce on this page are served up daily to hundreds of thousands of Canadians. Aside from the merits of the case, the general impression now is, that there is going to be another big scarcity of anthracite this winter. Every householder feels that he will be pinched by a coal shortage.

In districts where current is reasonably priced, the electric air heater requires a minimum of sales effort. It shows the householder how he can save coal. A little advertising, a vigorous window display, a few words of explanation, and nine out of ten average householders buy their air heaters, and feel grateful to the dealer for bringing the article to their attention.

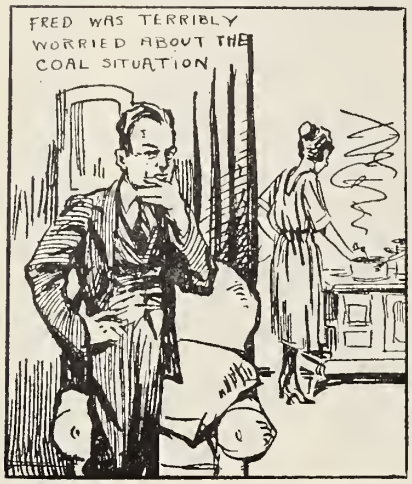
We in the business get so used to heaters and their qualities that we are inclined to forget that they are a mystery to a large part of the consuming public. Whether they really heat or whether they need special wiring, or whether they are dangerous or are high priced, are questions that a surprisingly large number of people can't answer.

Then why shouldn't every electrical dealer in the country answer these questions to his own circle of customers, and sell his own fair share of heaters?

Why not?

Why the Browns Have an Electric Heater

(An Every Day Drama in 3 Acts)



Frosted pumpkins, closed cars, standard time, and especially that chilly feeling in the morning, are little reminders of the season. They are driving home to Fred Brown the fact that his bin is still empty of all but the remains of last year's coal. And the dealers are unanimously pessimistic. We see Fred posed as the "Thinker," one cool September morn, figuring out what means he can adopt to get along until the coal man will give him some part of his year's supply.







And here we have the inspiration penetrating Fred's new fall fedora. It happens as he is on his way down to the office. Bang in the eye, first by one window display of electric heating apparatus, and then by another. More power to your elbow, Mr. Dealer!

Now for the final act of this little domestic drama. Fred has purchased a "Hot Glow" electric grate heater and his wife and he are basking in the cheerful rays. What a blessing to be rid of the troublesome task of carrying up coal and kindling for the old coal grate! And besides there is a dandy portable heater in the bedroom. The little black demon called "Coal Worry" has been given a setback, thanks to Mr. Electrical Dealer's window display.



What will Happen to Our Heater Trade?

All Signs Point to Big Demand This Fall

Babson's services are at a discount when it comes to prognosticating on coming heater sales. Any doubtful minded dealer, jobber or central station man has but to cast a glance at the following facts to be assured that the demand will be big:

(a) The field is not by any means saturated. Just count over the number of your friends and acquaintances who do not own electric heaters. Every one of them has an inclination to buy one now.

(b) The probable scarcity of anthracite is alarming the whole consumer population of Canada. All of us are uneasy at the prospect of empty coal bins. No one will depend on the heater as a mainstay, but to warm up that "hard-to-heat" room, to use in the bathroom, or the bedroom, the electric heater will be a blessing.

(c) Manufacturers, dealers and even the consumers, are all looking about and advertising electric heaters as they never did before.

The writer spent some time in listening to the comments made by sightseers at the Canadian National Exhibition, as they viewed the exhibits of electric heaters. Here are some of these comments as they fell from the lips of eager sightseers:

"That looks like what we wanted for the attic room. I wonder what they cost?"

"I don't feel like laying in a stock of coal just now, and one of those heaters ought to be useful in the meantime."

"Jim, you don't know what comfort in the bathroom is, if you don't use an electric heater. Out of the tub and into the glow—Boy! It's great."

"I think they look nice, but Mrs. Anderson had one last year and it burned out so soon." (This lady obviously needs educating—probably Mrs. Anderson's was not the guaranteed kind.)

These and a hundred like remarks, showed what people are thinking about in regard to electric heaters. They are curious and ready for more information. Some certainly require educating to rid them of the idea that air heaters are expensive, troublesome and dangerous. Others are in that state of mind which may be defined as neutral. They are like the young married man who has never given life insurance a thought. He is just about ready for the insurance salesman, and the first to get to him collects. In the case of the heaters, the electrical dealer who hits first (and hardest) with his advertising and window display, is the man who reaps the harvest.

Feed Them With Pipe-Dreams and Sell Electric Grates

"It was a winter's night, and the north wind blew cold across the tiles and chimney pots. The street lamps gleamed dimly through the swirling snow-flakes, and by their dim light, the occasional wayfarers appeared to be no more than animated snow men.

"But all this hurly-burly storm meant nothing to one wise individual, who sat comfortably in an over-stuffed chair, in the coziest, snuggest room of his snug little house. On his feet were his slippers, on his back a soft housecoat, in his mouth a favorite pipe, and in his hand the evening paper. As he leaned back and puffed out a blue cloud, he reflected that all his other appurtenances of comfort, even the soft and soothing light, would have been as naught without the handsome electric grate, which filled the room with a delicious glow."

Well, says the reader, that's a pretty little story, but we all know electric grates make rooms comfortable in winter time.

Do we?

Perhaps we do know it, but do we know it so well that we can sell others on the idea? Can we take Will Hobbs, from across the street, and show him that an electric grate in his living room will keep it comfortable all winter at a cost below what would be necessary for coal?

Do we visualize it for the prospect? We can hardly give as convincing a demonstration as we can with a washing machine, but we can paint a picture of what it would mean to him; we can even set the heater in his vacant fireplace. Let us remember that demonstration is the greatest single force in selling, and arrange our sales effort with that in mind. Visualization is the secret of sales.

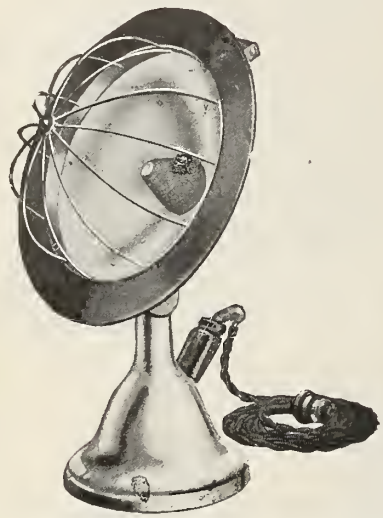
Standard Underground Cable Co.

A notice has been received stating that the General Offices of Standard Underground Cable Co., are now located at 100-108 Seventh St., Pittsburgh, Pa.

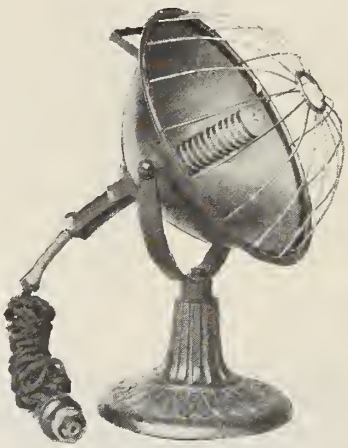
Carrying the Heater Message

A concern across the border recently put across the electric heater idea in a novel way. They drove about the streets a large electric truck specially fitted and wired, with a 4½-ft. heater. This heater drew 50 amp. at 220 volts, and when directed toward anyone it made itself felt instantaneously. The effect was quite startling in many cases. On particularly cold mornings a small crowd gathered to get warm whenever the car stopped and in this way was caused quite a bit of favorable comment.

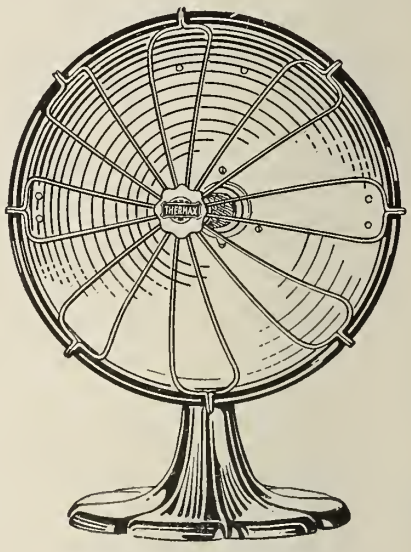
And Now the Public Eye Turns to Electric Heating



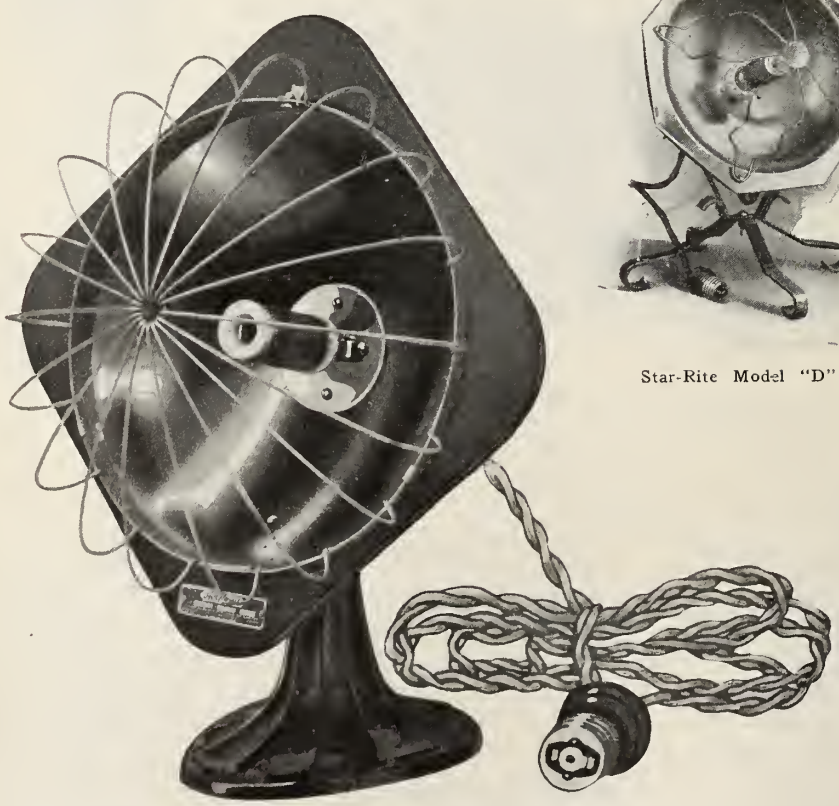
National Electric Heating Co. "Heatray"



Little Canadian Beauty—Renfrew Electric Products



The Great West Electric Co., Portable Heater



Hotpoint "Hedlite" Can. General Electric Co.

Star-Rite Model "D"



The Polar Cub—A. C. Gilbert Menzies Company

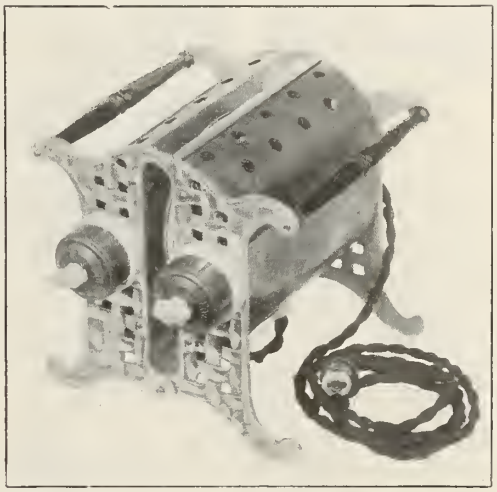
Models for Every Taste and Every Purse



A popular reflector type—Equator Mfg. Co.



A neat little 2,000 watt industrial heater by Canadian Westinghouse Co.



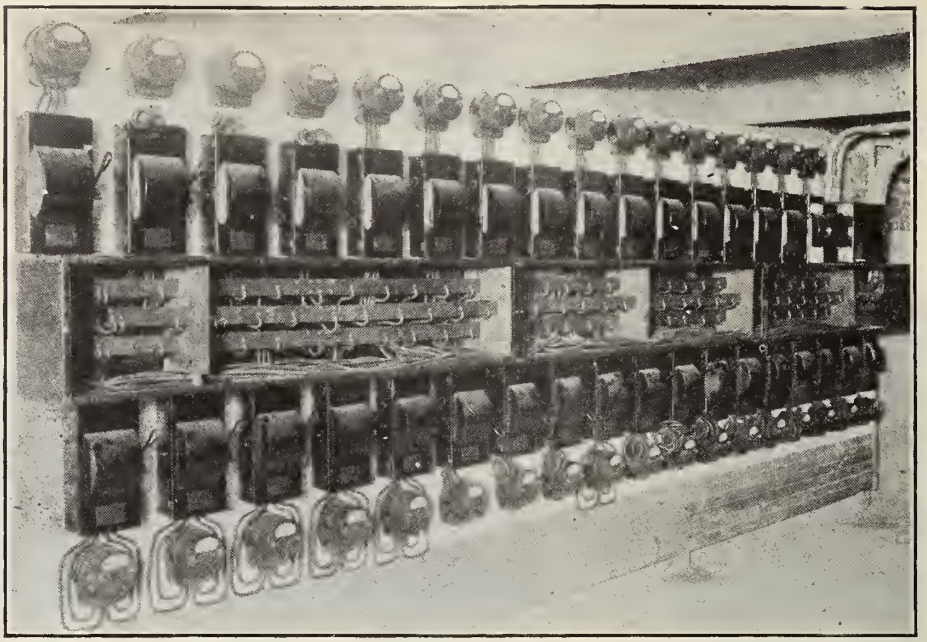
The "Triplex" combined Heater and Stove
Triplex Electric Manufacturing Co.



The Cosy Glow—Canadian Westinghouse Co.



A "Bungalow" grate—National Elec. Heating Co.



Distributing Board in Buckingham Apartments, Toronto, made by Canadian Drill & Electric Box Co.

A "Quality First" Wiring Job in Large Apartment House

Conduit Used Throughout—Distributing Board 18 Feet Long—An Electric Range for Each Tenant

A significant mark of the advance which has been made in the popular conception of what constitutes adequate wiring, is presented in the job recently done on the Buckingham Apartment House, Toronto.

The building consists of 34 suites of apartments, and is of fireproof construction. Hence it afforded a wiring job where organization and plan were of great importance. The spread of the "Electrical Idea" is evidenced by the fact that electric fixtures, ranges and refrigeration are supplied to tenants. The wiring throughout the building is installed in iron conduit, a one-inch conduit containing three No. 6 double braid cable, extending from main distributing board in the basement to an iron cutout cabinet located in each suite.

The distributing board, illustrated above, is a fine example of this class of work. It consists of an iron gutter box 18 feet long by 14 inches high by 10 inches deep. In this cabinet are mounted two 2-inch by 4-inch bus-bars. The bus-bars are held in position by 3/8 sheet fibre, 14 inches by 10 inches, through which they run. No. 6 cable is used to connect with switches. A slot is provided in the gutter box to give access to the wires from the gutter box through the service switches to the meters and return. There are several details of construction which indicate a thorough understanding of requirements, the end fastening of the bus bars, the liberal use of good material, the careful finish, are all points that mean good workmanship.

The box and service equipment were supplied by the Canadian Drill and Electric Box Company, who designed the same to order. The same company supplied the main service switch which is of 1000 ampere capacity.

The electrical equipment is of a high order throughout. Each suite has outlets as follows: Living room, four brackets, one switch and two base plugs; bed room, No. 1, two brackets, one switch and two base plugs; bed room No. 2, two brackets, one switch and two base plugs; bathroom, one bracket, one switch, and one outlet for electric heater; kitchen, one center light, one switch, one outlet for electric iron, and one outlet for electric range.

Lighting fixtures are as follows: living room, silver finish candlebra; bedroom, two-light candlebra and single-light unit; bathroom and kitchen, white enamel ceiling band with shade. Corridors are lighted with ceiling bands with ivory tinted shade.

There is a certain amount of power wiring, at 550 v., for the ice machine and circulating pump for heating system. In the whole building there was used 20,000 feet of conduit, 50,000 feet of wire, 1,038 outlets, 250 switches, and 175 receptacles. The entire layout is due to Roxborough Dean, Limited.

Why the Credit Man Worries

An Article that Classifies the Branches of the Retail Electrical Business as to Credit Risk

By REY E. CHATFIELD*

Interpretation of the term "credit risk" by credit men in the electrical industry is likely to differ in various communities but generally one finds the accent on the word "risk" rather than on the word credit. The contractor dealer is deemed a distinct risk by most credit men which opinion is based on his ability to meet his obligations promptly when due. Pessimism in wholesale circles which might prevail under these conditions is more or less softened by the fact that each community boasts several contractor dealers who not only succeed in doing a comparatively large volume of business; but who discount their bills promptly. Unfortunately where one such contractor dealer is in business there are nineteen or twenty who pay their bills with greatest difficulty, provided they enjoy the privilege of credit at a wholesale house at all.

Four Divisions of the Electrical Business

An understanding of the problem can only be reached by an analysis of the contractor dealer branch of the electrical industry. The retail distributor branch of the industry can roughly be divided into four classifications:

First: The electrical dealers.

Second: The electrical contractor-dealers.

Third: The electrical contractors.

Fourth: The non-electrical distributor.

The fourth class of retail distributor is not of serious concern to credit men in the industry because he is generally a successful merchant distributing other lines of merchandise. He enters the electrical field because he is attracted by the possibility of profit in distributing electrical goods. His business is confined to the sale of various appliances and his experience as a merchant teaches him the need for careful buying and rapid turnover of stock.

The Specialty Man is a Good Risk

The first classification, viz.: the electrical dealer, is usually a specialist, that is he pushes some particular electrical merchandise, it may be washing machines, it may be vacuum cleaners or ranges. However the fact that he can sell aggressively a particular piece of merchandise successfully as a specialty stamps him either as a splendid salesman or a shrewd advertiser or perhaps a combination of both. Such electrical merchandise as he may sell other than his specialty is incidental. His firm makes no wiring installation and a sale means either a cash transaction or a part cash and part negotiable paper transaction which serves very well to meet the needs of the credit man and he pays promptly until he lends an attentive ear to the salesman with a long discount on a quantity purchase. If the average electrical dealer makes such a quantity purchase he automatically moves himself and his firm from the list of customers at which the credit man smiles, to that list which produces a frown and lines of worry in every credit man's brow. Any electrical dealer who purchases a quantity of merchandise sufficiently large to cut down his rate of merchandise turnover below four turns per year is making trouble for himself and for the credit man of his wholesale house. No matter how promptly he may have paid his bills in the past when his available capital is tied up in merchandise which takes time to move he becomes "slow pay" and a poor credit risk.

Where the Contractor-dealer Stands

The second classification viz:—the electrical contractor dealer, is perhaps the best and at the same time the worst, credit risk in the branch of the electrical industry under discussion. This comprises the



Pushing His Turnover

largest group of the four classifications. The contractor dealer merchandises appliances and also makes electrical wiring installations.

His path is fraught with all the dangers of the exclusive electrical dealer but he has in addition the gamble of estimating and installing electrical work for a predetermined and fixed price. As a merchant he is selling merchandise with little diversity in types of articles offered; in other words electrical merchandise is a short line. The limited scope offered for the merchant places the electrical contractor dealer

*Formerly secretary-manager, Electrical Service League of B. C.

on a par with other exclusive shops such as a ladies ready-made apparel shop or a men's hat shop. Unfortunately for the contractor dealer in some cases the fixed resale price on appliances does not give the sufficient margin to profitably conduct the business. The public has been educated in buying from an exclusive shop to pay specialty shop prices and the exclusive shop owner in other lines of business has learned that he can make the greater margin of profit needed to conduct such a business.

A Few Words About Margins

A recent analysis of an appliance price list published by a firm of national reputation as manufacturers of electrical appliances revealed some rather startling facts. Staple merchandise or appliances of every day sale carried what might be termed a long profit; at the same time slow moving appliances, such as tailors' irons, which are staple merchandise but from their very nature must be slow moving, carried a very narrow margin of profit. Some slow moving appliances which the dealer must stock carried as low a margin of profit as eleven per cent. gross when purchased in standard package quantity. It is a recognized and fundamental principle of merchandising the world over that slow-moving merchandise must, if it is desired to make a profit, carry a longer margin of profit than goods which move more rapidly.

An eleven per cent. margin on an article which is not carried in stock by the contractor dealer but delivered from the wholesale warehouse direct to the consumer is perhaps "found" business, but to stock such an article and wait six months for a sale leads to difficulties with the credit man. Too many contractor dealers fill their stores with slow-moving merchandise such as tailors' irons or dish-washing machines, which carry a small margin of profit. The wholesale house has a definite responsibility in the matter.

Speculative End of the Business

So much for the selling end of the contractor dealer business. The speculative part of the business, however, is the contracting or construction department—here is where the competition of "the man who does not know how" works such havoc. This competitor does not know how to estimate labor and does not know how to price a job once it is figured. Preparing an estimate properly calls for sufficient engineering skill and experience to devise an economical and efficient layout, to "take off" material accurately, to estimate the labor necessary to install that material and to Price the Job when the net estimates are made.

The price figured on a job can be determined with the same precision and accuracy used in measuring runs of pipe or counting outlet boxes. Too many contractors "add" twenty per cent. for profit. Others find from an accountant that their overhead is say twenty-five per cent. which expresses the relation of cost of operation to volume of business, and use this percentage as an addition to net cost and not as a percentage of resale on a job.

Thus the contractor dealer has two problems to face, one is is proper estimating, the other proper pricing. A number of estimating systems have been developed which take much of the guess work from estimating labor for electrical construction provided they are intelligently used. Too few contractor dealers use any estimating system at all but prefer to visualize a job part by part and rely upon their practical experience to guide them in "estimating" (guessing) the labor necessary. This is often disastrous practice because all journeymen do not produce the same amount of work in a given period while the contractor dealer who visualizes his job as a means



"It stamps him—as a salesman"

of estimating labor is prone to use as a measure the work a particular journeyman and helper can produce in a day.

If every contractor dealer used a good estimating system losses through faulty estimating would be negligible. With a proper estimate made any contractor can learn to price a job properly. When the contractor dealer realizes that below a certain margin he cannot afford to take work, he may cut his volume of business, but he certainly will increase his net profit.

Some Dealers Do Only "Time and Material" Jobs

The most successful contractor dealers in the West however do no actual contracting work. Their construction work is all done on a "time and material" basis with a result that their business has grown and prospered. There is no gamble in doing work on this basis but there is a definite responsibility on the part of the contractor dealer to treat his customer, and his customer's money, with the same care he would treat his own money if a job on a time and material basis were a straight contract. It takes real sales ability to conduct business along these lines but contractor-dealers who follow the practice find results amply repay their efforts.

Financing a Job on Progress Payments

Theoretically the straight electrical contractor should be the best credit risk of all four classifications



Vancouver electrical men attending convention of the Vancouver association of Electrical Contractors and Dealers, July 27, 1923. In the centre of the picture are Lawrence W. Davis, J. R. Strong and O. C. Small of New York. The convention was attended by 125 electrical dealers; contractors; manufacturers' and jobbers representatives and central station men. To the left of Mr. Davis is W. G. Murrin, vice-president of the British Columbia Electric Railway company, who presided over the evening banquet.

for many reasons. By comparison his overhead expense or operating cost is lower than the contractor dealer but it happens that the risks he takes are greater. The practice of drawing progress payments on construction work each month as work progresses should make it possible for a job to finance itself. Progress payments vary from 75 per cent. to 85 per cent. of time and material expended on a job each month. As no successful contractor takes a contract with a markup of less than twenty per cent., it is nearly impossible to get each month from these progressive payments the money needed to meet the accounts of wholesaler and to replenish the fund from which wages of journeymen are paid. With thirty day progress payments and thirty day credit at the wholesale house a contractor need have only funds sufficient to finance payroll for a month and still be a good credit risk.

The size of this fund to meet payroll and incidental expenses is what makes the contractor a worry to the credit man. This fund is the capital of the contractor and it is usually a somewhat limited amount. When the contractor has several jobs in progress he is hard put to meet the weekly payroll. Money that would ordinarily pay the material bills is used to meet the payroll. The contractor having used his progress payment in this way is still quite solvent if his jobs are properly estimated and **Priced** and at the completion of these jobs in progress would be able to meet his obligations. After waiting forty-five or sixty days however for a payment the credit man must have money. The harder he presses the contract or for money the harder that individual tries to get more jobs to produce the necessary money. Getting jobs under these circumstances generally means cutting prices and cut prices lead to bankruptcy. Fortunately contractors realize this and the experienced man is usually able to make satisfactory arrangements either with his wholesaler or with his bank to meet the temporary needs.

Summarizing the unfortunate condition of credit in the contractor dealer business we find the non-electrical distributor of electrical goods a good credit risk; the electrical dealer a good credit risk; the electrical contractor a fair risk; and the contractor dealer with rare exceptions the man who causes worry among credit men.

Ornamental Lighting for Point Grey, B. C.

Property owners of New Shaughnessy Heights, the C.P.R. residential section in Point Grey municipality voted by a large majority on August 18 to install a system of ornamental street lights at a cost of $75,000.

The standards will be of grey iron or concrete similar in design to the Garden City standard of the Northern Electric Company, will have a single light and will be equipped with ornamental clear ripple glass globes with reflector and refractor. Armored cable will be laid along the boulevards connecting each lamp. There will be 200 standards in all.

Sixty-eight blocks will be so illuminated, these being without street lights at present. For two years the municipality of Point Grey was lighted under an old contract with the British Columbia Electric Railway Company which had expired, and until it was renewed this year, no new lights were installed. Rather than install the ordinary type of lights at street intersections, municipal electrician Southen proposed the above scheme of ornamental standards which is the first to be used in residential districts of Vancouver.

"Concerning the Ex.—"



(Between you an' Me, Al

Firstly, of course, in any electrical man's consideration of the Canadian National Exhibition, is the question as to what it revealed as to the probable trend of business in the industry during the coming year.

The question cannot be answered in a word or a sentence, and the best of answers must be indefinite. But here are some facts that bear on the situation:

The number of people paying attention to electrical exhibits was greater than ever before.

Questions asked the attendants indicated a greater and more intelligent appreciation of electrical appliances.

Some exhibitors did a rushing business in particularly seasonable goods.

Money seemed plentiful.

Dealers were optimistic.

From all of which the only safe deduction is, that business is sure to be as good as it was last year, and indications are that it will be considerably better.

Demonstrating Danger of Electricity in Electrical Building

The most conspicuous thing in the Electrical Building was the least desirable. That is the lightning rod concern, with their constant exhibition of the dangers of electricity.

The place for that sort of a demonstration is in the grounds, in the neighbourhood of the agricultural implements. Violent snapping, and dangerous looking sparks, are not suitable adjuncts to the sale of domestic electric appliances. There can be no doubt that this display of the dangers of electricity is undoing a great deal of the work we have been building up for years.

Nervous women, who are afraid of the slight noise of a vacuum cleaner, and look upon electric washers as highly complicated machines (and there are untold thousands of women in this state of mind) are almost afraid to pass on that side of the electrical building. They see many electrical appliances in the Electrical Building, and then they see this monstrous cracking and snapping, with the result that the two are more or less associated in their minds, and a consequent greater sales resistance is formed.

The Flourishing Knocker

Knockety-knock, knock, knock, knock, the anvil chorus were working a double shift this year. Not everybody, not even a majority, not even a fair-sized minority, just a few persistent tongue-waggers who didn't like their competitors' demonstrations. Well, we imagine that kind of stuff doesn't hurt the intended victim, but comes back like a boomerang.

Our Affable Demonstrators

Three cheers for the hard working demonstrators who worked and smiled through those trying days! It often happened that the questioner could never possibly be a buyer of the article in question—he or she might be a citizen of the United States, or a farmer from an isolated district, yet courtesy never failed. Though steadily on the job for almost two weeks, and most of them heartily sick of it before it ended, there was no sign of weariness in any of the demonstrations, and the electrical industry here at least received adequate representation.

An interesting innovation was the occasional use of women as attendants in the booths. This seemed to be good business judging from the lack of restraint with which female prospects approached them.

Industry Not Fully Represented

It would be absurd to declare that the electrical industry was fully represented at the Canadian National Exhibition. Those exhibits that were on the scene were well up to standard, but there was a deplorable absence of lighting equipment, and of industrial apparatus. It is true there were examples of both, but the whole field was not by any means represented.

After looking over the show, an observer carried away the feeling that it would have been much more impressive, and a greater benefit to the industry, if all branches of the industry were represented and they were all grouped in one large building of a design and character suitable to the importance of the industry.

Mr. E. H. Scott, of the Imperial Oil Company, Welland, Ont., was in Toronto for a brief visit during the Exhibition.

Representatives of the Industry at Canada's National Fair

Babcock Importing Co.—Empire lighting fixtures, illuminating glassware. Representative, G. A. Babcock.

Beatty Bros., Ltd.—1900 Cataract electric washer, 1900 White Cap electric washer, 1900 Agitator electric washer. Representative, J. W. Richmond.

Beattie, McIntyre Co.—Simplex ironer, Royal vacuum cleaner, Laundry-ette washers.

Chas. A. Branston Co.—Branston standard radio sets and parts. Representative, H. W. Northover, G. Best, H. Paliss and H. Roberts.

Brantford Washing Machine Co., Ltd.—Locomotive electric washer. Representatives; M. Chalk, N. Andrews, A. C. Lyons.

Burgess Battery Company—Burgess Batteries Representatives; L. A. Baker and F. C. Carman.

Cadillac Vacuum Cleaner Co.—Cadillac vacuum cleaner. Representative, Mr. Merrick.

Canadian Brandes Limited—Brandes head sets, Westinghouse Senior, Senior amplifier, valves. Representatives, John B. Byers.

Canadian General Electric Co.—(in Electrical Building—A model kitchen with Hotpoint Range, Eden washer, electric water heater etc. Another part of the booth showed Hotpoint appliances, including the new range with its exclusive features. The C. G. E. lamp manufacturing exhibit is described elsewhere in this issue. Representative, J. L. Davidson.

Can. Independent Telephone Co.—Wireless equipment, loop receiver, intercommunicating telephones. representative, H. L. Varcoe.

Canadian National Carbon Co.—Eveready wireless batteries, flashlights and Columbia batteries. Representative, C. F. Welch.

Canadian Radio Electric Co.—Radio supplies. Representative, Wm. A. McWatters.

Canadian Westinghouse Co., Ltd.—Westinghouse radio sets, amplifiers, and valves. Representative, Wm. Orr.

Century Electric Co.—Motors of various types, electric fans.

Coffield Washer Co.—Complete line of Coffield washers making a very fine display. Representative, F. Babcock.

J. H. Connor & Son, Ottawa—Complete Connor line; also demonstration of old and new way of washing. Representative, Mr. Connor.

Continental Electric Co., Ltd.—Royal electric suction cleaner; Royal electric hair clipper, dryer and vibrator. Representative, C. F. T. Hooper.

Diamond State Fibre Co. of Canada, Ltd.—Fibre



Booth of the Canadian General Electric Co., in the Electrical Building

products, Condensite Celeron. Representatives, J. A. Regan, Montreal, R. Rae, and T. J. McFadden.

Dominion Battery Co., Toronto.—"Reliable" dry batteries and flashlights.

Dominion Engineering Agency, Ltd.—I-T-E circuit breakers and U-RE-LITES, Sundh Control, Schweitzer & Conrad Hi-Tension equipment; Robbins & Myers Motors; Rawlplugs; Mid-West Air Filters; Acme Magnet Wire and Varnished Insulation. Representative, D. M. Fraser.

Duffie Electric Manufacturing Co., Ltd.—Tropical automatic electric water heater, Tropical electric reflector heater. Representatives, A. E. Smalley, E. J. Byrne and R. A. Sutherland.

Durable Electric Appliance Co., Ltd.—Durable heaters and grates. Representative, Mr. Hamilton.

Easy Washing Machine Co.—Easy electric washer (3 types) and Easiette. Representative, H. S. Shannon.

Electric Systems, Ltd.—Frigidaire complete refrigerator, Keith electric refrigerator, Delco Light electric washer. Representatives, J. P. McNair and E. W. Bickle.

Exide Batteries of Canada, Ltd.—Exide cell central station type, Ironclad-Exide submarine cell, Chloride cell. Representatives, A. E. Wilkes, J. R. McLean, F. C. A. Houston.

J. D. Ford Radio Equipment Co.—Complete line of radio apparatus, representing principal manufacturers. Showing a Zenith set as used by Dr. McMillan on Artic trip. Representative, J. D. Ford.

Findlay Bros., Carleton Place, Ont.—Electric ranges.

Fuller United Electrical Works, Ltd.—Represented by Canadian Foreign Products, Ltd., 45 Jarvis St., Toronto. Wireless accumulators, storage batteries. Representative in charge of battery division of company, R. M. Jones.

General Radio Co. (England)—Complete radio sets. Shown in International Exhibit by Federation of British Industries.

Gibson Radio Supply—High power transmitting and receiving sets; Federal equipment, home charges, console tables with receiving sets combined complete; accessories of all kinds. Representative, Mr. Gibson.

Gladstone Electric Limited—Electric range with enclosed element. Representative, G. H. Jackson.

Hart Storage Battery Company—Storage batteries. Representatives, W. H. Smith, L. J. Washer.

Hoover Co., Ltd.—Hoover cleaners. Representative, J. F. Paxton.

Hurley Machine Co., Ltd.—New Thor superior oscillator, Walker dishwasher. Representatives, O. S. Johnston and Grover Clark.

Hydro Appliances, Ltd.—Miss Niagara electric washing machine. Representative, W. R. Mathews, Fonthill, Ont.

Ingersoll Machine & Tool Co.,—Electric ironers. Representative, G. Tingle.

International Business Machines Co., Ltd.—Electric time systems, time stamps, recording door lock, watchman systems. Representatives, A. Christie, E. Liddell, P. Donohue.

Inventions Limited.—Rawlplugs.

Jack Frost Ice Machine Co.—Electric refrigerators.

Jones & Moore Electric Co.—Century motors, fans. Representative, S. Moore.

Lincoln Electric Co. of Canada, Ltd.—Electric motors, welders, truck welding supplies and welding wire. Representatives, Chas. B. Gibson and Geo. P. Eaton.

Lancashire Dynamo & Motor Co.—Motors, generators, starters and welders. Representative, A. Lloyd.

Link-Belt Company, Ltd.—Complete line of belts; featuring vision slow-up device so motion may be seen.

London Metal Products Limited.—"Wonder" washing machine. Representative, G. E. B. Wheeler.

Mack Storage Batteries of Canada.—Storage batteries. Representatives, Mr. Burton and Mr. Windeler.

Marconi Wireless Telegraph Co., Ltd.—Broadcasting and transmitting sets. Representatives, E. F. Gilmour, J. Crawford.

Masco Company, Ltd.— A.B.C. Washers and ironers, Alco washer, Super electric cylinder type, oscillating washer with copper tub and hydro-vac washer. Representative, Geo. W. Patterson.

Maxwells' Limited.—Super-Vac electric washer, Mono-Vac washer, Minimac Dolly washer. Representatives, R. McAlpine and W. F. Selby.

McClary Manufacturing Co.—Electric cooking appliances. Featuring new No. 10 range.

McDonald & Willson Co., Ltd.—Fixtures and appliances. Representatives, Messrs. Tomlinson and Black.

Moffatt's Limited.—An extensive line of electric stoves, water heaters and heating appliances. Repre-



Timely advertising used by the Mahon Electric Co., Fort William, Ont.

sentatives, T. L. Moffatt, W. F. Moffatt, and Mr. Rutland.

D. Moore Co.—Electric ranges, grates, water heaters and hotplates. Representative, G. F. Moodie.

National Electric Heating Co.—New electric range with new burner, grates, air heaters, appliances. Representative, Mr. Frankel.

Northern Aluminum Co.—Domestic cooking appliances of aluminum.

Northern Electric Company.—Radio parts, complete sets, rural telephone parts, switchboards and new automatic telephones, Gurney ranges. Representative, F. Seeds.

Ohio Vacuum Cleaner Co. (Manufactured by United Electric Cleaner Co. of Canada)—Ohio cleaners and Gainaday washers. Representatice, Mr. Lem Atkinson.

Onward Mfg. Co.—Sunnysuds washer and Eureka vacuum cleaners. Representative, Mr. W. H. Flewwelling.

Premier Vacuum Cleaner Co., Ltd.—Premier Duplex cleaners, Apex washing machines. Representative, M. W. Lapp.

Prest-O-Lite Co. of Canada, Ltd.—Automobile lighting and starting batteries and parts. Farm plant lighting batteries, radio "A" batteries. Representatives, Messrs. Northwood, Merdith, Nelson and Oille.

Renfrew Electric Products, Ltd.—Majestic heaters, grates, hot plates, toasters, etc. Representative, H. E. Doty.

P. L. Robertson Manufacturing Co.—Socket head screw, showing complete household set.

Sepco Automatic Heaters Limited.—Automatic electric water heaters of various types, electric glue pots, electric stamp vulcanizer. Representative, Mr. Burns.

Square D. Company.—Complete line of Square D switch boxes and standardized switch for apartment house use. Representative, C. H. Keeling, W. R. McCallum.

Stromberg-Carlson Co.—Telephone sets and radio heat sets, construction material, lineman tools. Representatives, J. A. Berger, C. W. Pointon, Geo. E. Adair, J. McNair and N. W. Baldwin.

Sun Floor Waxer & Polisher (Thompson Enterprise Co., 100 Adelaide East,)—Sun floor waxer and polisher, different models. Representative, C. R. Griffin.

Toronto Hydro-electric System—Range, ironer, washer, etc. An educational booth to spread the electrical idea. Representative, W. E. G. Robertson.

Triplex Electric Mfg. Co.—Combined. electric cooker and heater. Representative, A. S. Johnston.

Vimy Supply Co.—Complete line of radio equipment. Representative, J. E. Askham.

Willard Storage Batteries Co. of Canada, Ltd.—Storage batteries, radio batteries. Representatives, F. W. Bryan, C. W. Vinson, George Watson.

Another British Firm Looking Us Over

Handle Fuller Batteries

The industry will be interested to learn that another British electrical firm, Messrs. Fuller's United Electric Works, Ltd., of Chadwell Heath, London, is taking an inventory of the Canadian market for their various manufacturers. Mr. F. J. Gordon, the sales director, is making an extended tour throughout Canada and is visiting Montreal, Toronto, Windsor, Winnipeg, Calgary, Moose Jaw, Regina, Saskatoon, Edmonton, Vancouver and Victoria, B. C. He has just spent some time at the Canadian National Exhibition, Toronto, where his company exhibited a comprehensive range of products. These include the



Mr. F. J. Gordon

"Sparta" battery, for automobile starting, lighting and ignition; "Block" batteries, adopted by leading British radio authorities; radio accessories, embodying Fuller's exclusive patented features; Fuller's patent inert cells; Mansbridge telephone and telegraph condensers; electrical cables ranging from heavily armoured large sections to the smaller insulated wire, etc., as well as specimens of their ebonite manufactures, which are a special feature of the firm's output. Messrs. Fuller's are widely known for the excellence of their batteries and other electrical products as the result of their manufacturing experience extending over 50 years. Mr. Gordon has Toronto headquarters at Messrs. Macaulay Pope, Ltd., Dominion Bank Chambers, 186 Bay street, Toronto.

Two Billion for Canada

The Joint Society for Business Development in the United States estimates that there are twenty billion dollars worth of electrical sales in sight. In the same proportion this would mean at least two billion dollars in Canada. That doesn't look like a slump.

"Soft Solder" Will Sell Washers

"Soft Solder" was what Sam Slick used, to sell 8 day clocks. It works with electric washing machines, too. When you have an off day, slip an oil can and a pair of pliers in your pocket and drop in on the customers who have recently bought washers. Every one of them will let you look at the machine. Maybe there is some little adjustment you can make. A friendly attitude on your part will start a conversation going, and you can easily find out how her friends do their washing. Names and addresses can generally be obtained without trouble, and before long you can be away with a fair list of prospects.

Roy Harris Has the Right Idea

Mr. Roy E. Harris, Bennington Electric Co., Stratford, Ont., has the right idea for selling washers. He writes in part as follows:

"Once we get a prospective purchaser we endeavor to put a machine in the home for one wash day.

"When we succeed I make it a point to be right on the job myself and supervise and instruct the prospect thoroughly.

"We always refer to the machine as hers and keep on telling her how it will assist in saving her labors.

"We have found that it is a very good idea to have the prospect do her other work while the machine is washing the first two or three tubs of clothes. This impresses upon her mind the fact that she can carry on her other household duties and incidentally do her washing as well.

"Some times the prospect insists upon running the washing right through, so in such cases, from the time the first tub is washed, we endeavor to keep those clothes in motion until they reach the clothesline. And then we keep on in this manner with the balance of the washing."

Death of W. L. Wilton

W. L. Wilton, office manager for the Onward Mfg. Co., Ltd., Kitchener, Ont., died August 6th at the Winnipeg General Hospital, from pneumonia, contracted while he was on a business trip to Winnipeg for his firm. He left about a month previous but on contracting the disease steadily grew worse. Mr. Wilton was born in England, coming to Canada about 13 years ago. He was employed by the T. Eaton Company previous to going to Kitchener. He was well known in sporting circles being an ardent lover of football and cricket as well as baseball and hockey. He was a member of the young Men's Club of Waterloo and he was also secretary of the Waterloo Cricket Club.

Trade Notes

The Quebec Standard Electric Heater Company has recently been registered in Montreal.

The Wilder Radio Company has been recently registered in Montreal.

The Phoenix Electric Company, 1161 Dufferin St., Toronto, has been registered as repairers and dealers in electrical supplies.

Remember That You Must Sell Friend Husband

If a prospect hesitates, it is possible sne is thinking of talking the matter over with her husband. If this is the case, make it a point to get there early in the evening, so that you can properly present this matter to friend husband. The wife may be thoroughly sold on the machine, but she lacks your ability to present the case in the proper light, so be on hand early.

What to Look for in a Fixture

Standards That Good Fixtures Must Conform to—the Right Equipment for Different Rooms

By F. W. JOHNSON*

In the illumination of the home, the decorative element predominates, but nevertheless to be satisfactory it must comply with the general rules for good lighting.

Nearly all electric lights, used in residences where appearances are at all considered, are supported on some sort of fixture which may take the form of centre chandelier, side bracket, standard or table lamp. As these necessarily become prominent parts of the furnishings of the rooms, it is desirable that they should be made as pleasing as possible.

While no attempt is to be made in these pages to define closely what is beautiful and what is not, it will still be of value to note the principal points to which all things that are to be considered beautiful must conform.

What to Look for in a Fixture

Nothing can long be considered as handsome or beautiful that is not useful. This utility may be considered from three different points. It may consist entirely in practical utility, the fixture being merely a substantial and suitable support for the electric light. It may serve the purpose of relieving us of the sense of monotony or sameness by being distinctly different from other fixtures, thus pleasing us by the variation. It may be the means of conferring some degree of distinction upon the owner, by its uniqueness, elaborateness, expensiveness, or other special features. The more difficult these may be to reproduce, the greater will be the value.

All of these points may be, of course, combined in one fixture and the more naturally and unostentatiously the last two can be made to appear to serve the purpose of practical utility, the greater will be the actual and lasting beauty of the fixture.

No matter how much, to obtain variety, the form and the nature of material used may vary, it must always be arranged so as apparently to serve the purpose of practical utility.

No fixture should be chosen merely for its own appearance, but the surroundings in which it is to be used should be duly considered. Elaborate fixtures should be used only where the cost or trouble of keeping them properly cleaned will not be burdensome.

The Living Room

In living rooms the use of a central ceiling fixture has been the almost invariable rule and, from the standpoint of efficiency, no better location could be found for the light source. Yet with this arrangement of illumination, there also should be well shaded wall brackets and table lamps to give a pleasing and home-like impression, for with these the lighting may be localized and the effect of light and shade may be obtained in any degree desired. In such installations, however, where the centre fixture has been omitted entirely, complete satisfaction is often lacking because of the difficulty of adequately illuminating the entire room, should the occasion require.

The Dining Room

To satisfactorily light a dining-room, lighting fix-

*Northern Electric Company.



Part of the Northern Electric Line

tures must always be hung from the centre of the ceiling. The choice of fixtures which will produce a pleasing illumination is, however, a matter which requires much thought. The real purpose of light in the dining-room is to provide a good illumination on the table and a soft light on the faces of those seated about it. In obtaining these effects, no type of fixture has ever surpassed a well-designed candle fixture or chandelier equipped with a number of well shaded lamps. With these fixtures, the table itself receives a high intensity of illumination direct from the lamps, but these lamps do not glare in the eyes of those seated around.

The Rest of the House

The same principles apply equally to other parts of the home, the bedrooms, kitchen, hallway, etc., the selection as to style of drop or bracket fixtures being covered by conditions to be met with the objective of combining proper illumination with harmonious decorative effects.

In the Northern Electric Line of residential fixtures several of which are illustrated in this article, care has been taken to conform to all the "lighting" standards in order to ensure the utmost illumination being given. The combining of detail in the castings with color of finishes has been carefully thought out.

Now Selling from Toronto Office

The Magicoal Electric Fires (Canada) Limited, have now completed their new uptown showrooms in Montreal at 291 Mountain St., just below St. Catherine St. They have an interesting display of fire places of all periods and styles and have recently received orders for a number of special designs. The "Magicoal" can be made to suit any conditions and this has enabled architects to embody just what they want under sometimes difficult conditions. A number of fine examples of the wood-carver's art are now being erected at the Montreal showrooms in the form of Tudor fire-places in black oak, fitted with the latest designs of this company's grates; another recently developed type, which is portable if necessary, will also be on the market within a few weeks. The Canadian Electrical Equipment Co., Ltd., 199 Howard Park Ave., Toronto, F. H. Moody, manager, are looking after the Magicoal interests in Toronto and district.

Nesbitt Elec. Mfg. Co. Move

The Nesbitt Electric Mfg. Co., have moved their offices from 27 Melinda St., and their factory from 20 Hayter St., to 60 Duchess St., Toronto. This move brings the offices and factory together in one building, and will result in the firm having much greater space at their disposal, with a consequent improvement of their already good service, to their customers.

Messrs. R. E. T. Pringle have moved their offices and warehouse from 27 Melinda St., Toronto, to 60 Duchess St.

G. W. Hague With National Elec. Heating Co.

Mr. G. W. Hague, who has been with the Canadian General Electric Company as manager of the Hotpoint Sales Division for the past 2 years, has now become Sales-manager of the National Electric Heating Company. Mr. Hague is well-known to the trade



G. W. Hague

generally. The National Electric Heating Co. have been compelled, owing to expansion of business, to enlarge their organization so that they may extend the good service and attention they have rendered in the past, to a larger circle of customers.

Trade Notes

"Gyproc" Plaster Board for use in lining wooden cabinets and meter-boards, has been approved by the Ontario Hydro-Electric Power Commission.

The Canada Gazette announces the incorporation of the Ottawa River Power Company, Ltd., with a capitalization of $450,000. The head office of the company will be at Hull, Que.

The Onward Mfg. Co., Kitchener, have opened a re-sale store at Lethbridge, Alta., known as Eureka Appliance Co., under the management of J. E. May.

The MacBeth-Evans Glass Company, Pittsburgh, Pa., have announced the closing of their Toronto office. The interests of the company in Canada are being taken care of by Mr. Harry T. Wharton, 225 St. Clarens Ave., Toronto. Mr. J. F. Heffron, manager of the Toronto office for many years, has returned to the head office at Pittsburgh.

Room for Original Ideas in Radio Merchandising

At this time of year the radio question is agitating many electrical dealers. The problems of how to go about it, what stock to carry, how to advertise and how to sell it, are real ones. Light upon the situation was asked from a prominent and successful radio dealer, and in reply he jotted down a list of points which are reproduced below:—

1. Unquestionably the most important thing is to stock up with the right merchandise. You must carry a reliable line and a complete line.
2. Some dealers are not fully aware of the fact that radio must be SOLD, the same as any other article of merchandise. That means that the salesman must know the goods—in other words, the selling points and general handling of the merchandise.
3. There must be one man available who has a thorough knowledge of the technicalities of radio. Real radio bugs lose confidence in the store and its merchandise if they find that they cannot get information about some technical points.
4. Trace up the growth of any large retail store. You will always find that they have followed a systematic plan of advertising—not the single blow kind, either. Regular space is the secret. Radio merchandising requires the same steady consistent effort.
5. Judging from the windows one sees, this part of the business needs considerable attention. Is a man afraid of his prices that he won't put them on the goods in the window? Too much stuff in the window is confusing.

Finally, let us say that if there is room for original ideas anywhere, there is room in radio merchandising. An ingenious scheme to secure publicity, to demonstrate the product, or extra servicing, will always reap results. The time will come when we will look back to these times as early days in radio. The business is going to grow, and the man who gets into it now, and LEARNS it, will grow with it.

All reports from our National Exhibition are favorable, and we of the industry can look forward to our fair share of whatever radio business is going.

Writing the Radio Ad.

Radio dealers should never be afraid of writing their own advertisements if they know the rudiments of successful salesmanship.

Forgetting for the moment the reams and reams of matter that have been written about advertising, here are the four essentials of knowledge the advertiser should have:

Knowledge of the goods that are offered.

Knowledge of the people to whom they should appeal.

Knowledge of the reasons why they should appeal.

Knowledge of the service and satisfaction buyers will get from the goods.

Having these ideas firmly in his mind, the electrical lealer should sit down and think what are the best mediums for getting his goods before the kind of people who should use them. Then he should stick to this decision.

Too often the dealer is the prey of advertising solicitors, often asking patronage for this or that souvenir booklet. The result is that three-quarters of the amount he sets aside for advertising goes out for donations. It is a fairly good plan for the dealer who has a small amount of money to spend, to put all his eggs in one basket and watch that basket. Remember, too, that your show windows are calculated to bring you about 50 per cent of your trade if your store is in a prominent location.

New Radio Catalogue

United Mfg. & Distributing Co., Chicago, U.S.A., are distributing a new catalogue. Interesting particulars of transformers, condensers and amplifier units are given.

Magnus Radio Catalogue

Catalogue No. 923, issued by Magnus Electric Co., Inc., New York, contains a variety of interesting apparatus, with several diagrams showing hold-ups.

Radio By-law In Iroquois Falls, Ont.

Iroquois Falls has now a radio by-law that prohibits any danger of antennae wires touching high voltage power lines. The by-law provides that permission must be obtained to erect antennae and these must conform to certain rules which will be enforced by the electrical inspector.

Devoe Electric Switch Company Catalogue

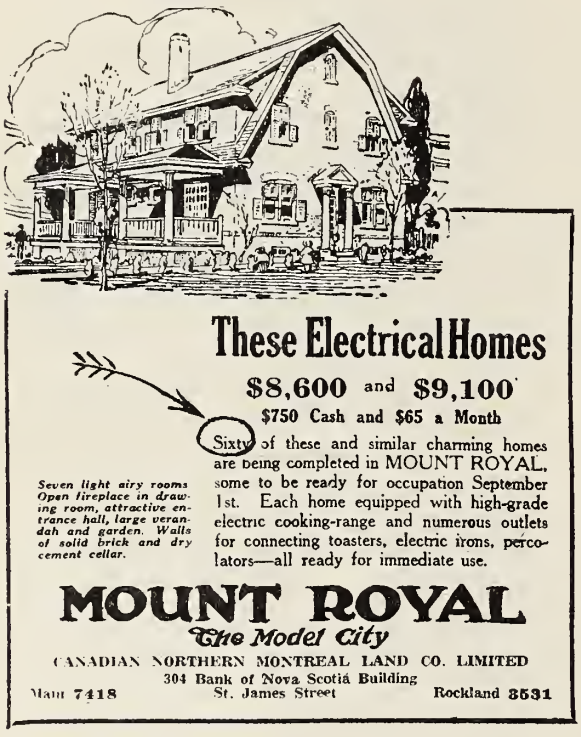
A catalogue which should be in the hands of everybody in the trade, has recently been issued by the Devoe Electric Switch Company. 144 well-illustrated pages are devoted to the presentation of this company's products, including switches, panel boards, switch boards, formed steel boxes, steel and wooden cabinets, and other electrical specialties.

Have You Been Looking for a Sign?

"Yes, we all believe in electrical propaganda. It is the thing to educate the general public. A very wise move, indeed."

So we say with our mouths, but in our hearts we don't all believe. Else we should dig down in our pockets and support more enthusiastically our Associations and electrical pages, and so on.

But for the doubting Thomases there is at last a sign. It concerns the efforts put forth by a few who saw the light in Montreal. The accompanying illustration is a reproduction of an advertisement, one of several which have recently appeared in the Montreal daily papers. Sixty electrically equipped homes for sale—surely, the electrical idea is taking hold. Louis Kon has this to say of the situation, "It is a proof that purposeful work, though with handicaps and very limited resources, does bring results."



The houses in question are priced at from $8,000 to $9,000, and are of the semi-detached type. Each house is already furnished with an electric range, and the wiring throughout is very complete.

News of the Trade

The premises of W. A. Haley, electrical contractor, Sussex, N. B., were recently destroyed by fire.

The Bancroft Light, Heat & Power Co., Ltd., Bancroft, Ont., has obtained a charter.

The Mather Electric Company, 1479 Yonge St., Toronto, are making some changes in their store arrangement.

The Triplex Electric Mfg. Co., Montreal, has been recently registered.

The National Electric & Supply Co., Montreal, has been registered.

Industrial Radio Store, Winnipeg, have sold stock & fixtures to J. L. Elvin, Ltd.

The Limerick Electric Light & Power Co., Ltd., Limerick, Sask., has been incorporated.

The Radio Supply Co., Montreal, has been registered.

The S. M. P. Electric Co., Montreal, has been dissolved.

The Ituna Light & Power Co., Ltd., Ituna, Sask., has changed its name to The Ituna Electric Light & Power Co., Ltd.

The Louch Electric Co., Brockville, Ont., recently sustained a fire loss.

The Jamaica Hydro-electric Co., Montreal, has obtained a charter.

The Radiolite Battery Co., Ltd., of Regina, is being re-organized.

The Orillia Construction & Service Corporation, Limited, was recently incorporated to carry on the work of general construction, electrical installation; plumbing and heating. The president is James Tressider; secretary-treasurer, G. Trussler; construction manager, James A. Cable.

The Canadian Radio Mfg. Co., has been registered at Levis, Que.

The Hessco Electric Mfg. Co., Toronto, has obtained a charter.

The Guaranteed Electrical Merchandise Co., has been registered in Montreal.

The Grinyer Electric Co. Ltd., Guelph, Ont., has obtained a charter.

The Nova Scotia Power Comsn., Halifax, N.S., received tenders until Sept. 10, for the construction of:—(1)—a 66,000 volt single circuit transmission line from Hopewell to Stellarton. (2)—a 13,200 volt transmission line from Stellarton to Pictou.

Plans are being prepared for an ornamental lighting system, at about $6,000, for Leamington, Ont.

D. Fraser and J. Hawkins, Nelson, B.C., have been awarded the contract for the building of the new power line from Nelson to Balfour, B. C., at a price of $11,200.

At the first meeting of the Quebec Power Co., formerly Public Service Corporation, an issue of $20,000,000 of bonds was decided on.

Harry Dearle, formerly of Brantford, Ont., has taken the position of Sales-manager with the Onward Mfg. Co., of Kitchener, manufacturers of Sunny Suds Washers and Eureka Vacuum Cleaners.

The Latest Developments in Electrical Equipment

Dayton Display Fixture

The Dayton Display Fixture Company are manufacturing a fixture especially designed for the display of electrical goods. The construction of this fixture is indicated in the accompanying illustration.



It is made of heavy metal, well reinforced, and mounted on roller bearing casters. The finish is enamel, and washable. Four models are made, varying in weight from 270 to 490 pounds.

Linemen's Shoe

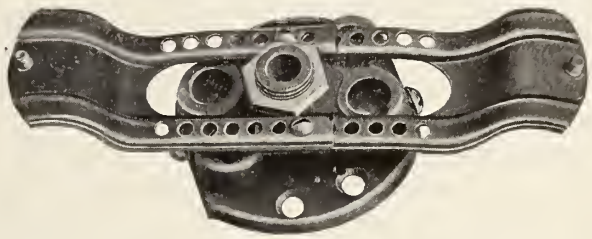
The Linemen Protector Co., 850 Penobscot Building, Detroit, Mich., are marketing a linemen's shoe with several interesting features. This shoe rs claimed to be vulcanized into a solid piece so that it



can not peel or come apart, and it is not affected by oil, gasoline or grease. No metal is used in any part of the construction. The shoe is said to be tested to 20,000 volts.

Adjustable Fixture Strap

The Adjustable Fixture Strap Company has brought out a patented fixture strap, designed to enable the wireman to conform with the rules which exist in some localities prohibiting the use of wood screws in connection with ceiling collars. The device is adjustable to any length from 4 to 8 inches. It is made of 22 gauge semi-soft steel. When a larger strap is required it is necessary only to loosen the



screws and adjust, shortening is easily accomplished by clipping the ends. The design of the strap allows it to fit any steel or cable box, and it is claimed that it can easily be re-shaped when desired.

Myers Vacuum Tubes

The E. B. Myers Company, 240 Craig Street, West, Montreal, Que., are carrying on an extensive campaign for the marketing of their vacuum tubes.



The tube shown herewith is known as the Myers Universal, and is capable of operation on either dry or storage battery. The tube comes complete with mounting clips, ready for use anywhere in a radio set.

National Open Hearth Grate



A popular number of the National line

Hand Book on Wires and Cables

Canada Wire & Cable Co., Toronto, Ont., have just issued a new catalogue and hand book of electrical wires and cables.

Current News and Notes

Beachville, Ont.

Beachville, Ont., is reconstructing its distribution system, changing it from 2300 to 4000 volt connection. The transformer station is being doubled in capacity.

Brantford, Ont.

When two hydro lines, each carrying 26,000 volts, were forced together, power was off in Brantford, Paris, Simcoe, Waterford, Burford, Drumbo, Princeton, Port Dover, and surrounding country for 35 minutes recently. The lines came into contact as a result of a noon blast in the east abutment of the old Lorne Bridge, near Brantford, Ont.

Coldwater, Ont.

Due to demand for more power in the municipality of Coldwater, Ont., the present transformers in the sub-station are being replaced with larger units, which will give an additional capacity of 50% above that of the original installation.

Digby, N.S.

It is stated that work on restoring the damage on the Sissiboo Falls, eight miles from the town of Digby, N.S., started on Aug 13 and that it is the intention of using this dam to supply power for lighting.

Edmonton, Alta.

On Aug. 30, at the Canadian Telephone Convention in Edmonton, Alta., Mr. Brockwell, of the Manitoba system, dealt with radio telephony, and stated that so far as present experience went there was absolutely no danger of the radio supplanting the telephone, either for long distance or for local work, although the radio should form a very efficient accessory of the telephone.

Edmonton, Alta.

John R. Lowry, head of the Manitoba Provincial Telephone System, was elected president of the Canadian Telephone Association at the concluding session of the association's convention on August 31, in Edmonton, Alta. Winnipeg was selected as the meeting place in 1924. A committee was appointed to take up with the Dominion Government during the coming year the question of what assistance the Government was prepared to give in the establishment of a transcontinental telephone line, in the way of bridging the gaps over the Rockies and through Northern Ontario.

Erin, Ont.

Erin, Ont., Village Council has contracted with the Cataract Light and Power Co. for 50 lights for the streets. The company is installing new poles and wires and otherwise reconstructing their line through the village.

Estevan, Sask.

The town of Estevan has contracted with Electrical Engineers, Ltd., of Calgary, Alta., for a new 300 kw. unit, as an addition to the present power plant. The purchase was made under the recommendation of J. B. Hamilton, town engineer, who decided on a Skinner Uniform Engine and a Westinghouse generator. The new unit is being rushed forward, to meet peak load demands, as Mr. Hamilton has succeeded in considerably increasing the load.

Goderich, Ont.

The town of Goderich, Ont., has received a contract from the Goderich Elevator & Transit Company for an additional 250 kilowatts. This makes a load of approximately 400 kilowatts from this company.

Grafton, N. S.

The Grafton Electric Light & Power Co., are adding 18 miles of 3 phase line to their system and have awarded contract for construction of same to J. C. Mitchell, Wolfville, N. S., at $20,000, the company to supply the wire.

Hampton, N. B.

The hydro system at Hampton Village, N. B., has been completed and services are being extended to private dwellings. There are 151 applications for meters. The Hampton rates are: Domestic lighting —Service charge, $1.00; plus 6c. a kw.h. for the first 20 kw.h., plus 3c. for all additional kw.h. This works out at 3.5c a kw.h. for a consumption of 300 kw.h. and can be attained by use of a cooking range. Power —Service charge 11.00 per horsepower per month, plus 4.5c. a kw.h. for the first 50 hours of connected load, plus 3c. a kw.h. for all additional kw.h. A discount of 10 per cent. is allowed on power consumption, but not on lighting.

Hyde Park, Ont.

At a congregational meeting recently held in the Presbyterian schoolroom the vote for installing electricity in the church and manse was unanimously carried in favor of hydro, the wiring to be started shortly.

Kitchener, Ont.

The utilities commission has decided to instal a new wiring system and new lights on the top of the water-tower on Edward street, Kitchener, Ont. A number of years ago there were lights on the tower and it is the intention to again illuminate the top of the building.

Komoka, Ont.

A rural hydro extension is being built approxi-

mately eight and one half miles north from Delaware Station into Lobo Township, to supply consumers in Komoka and vicinity, and also in Caradoc.

Ladysmith, B. C.

If the plans mature, the cities of Ladysmith, Nanaimo and Duncan on Vancouver Island may obtain their electric current from the British Columbia Electric Railway Company's plant at Jordan River. Several towns have signified their desire to take current from the central station company instead of generating it themselves and if sufficient large customers can be obtained in this way and from among the large coal mines, a high tension line will be built from Victoria.

London, Ont.

A number of short hydro rural extensions are being constructed in the London, Ont., rural district, which will total approximately twenty-nine and one-half miles. These extensions will add 153 new rural consumers to the district.

Manager Buchanan of the Public Utilities Commission, London, Ont., is working toward the elimination of all storm trouble on the local power lines by placing 13,000-volt feeder lines and all 2,300-volt. distribution lines in the city underground. He expects to have all the feeder lines underground inside of a few years.

Midland, Ont.

The Grand Trunk Pacific Elevator at Midland, Ont., is being enlarged and this concern will require an additional 200 or 300 h.p. of electric energy by October or November next.

Montreal, Que.

A press report states that a group of Montreal and Quebec interests have concluded arrangements for the formation of the Laurentide Hydro-Electric Power Company, Limited. They plan to operate in the Laurentian field, having acquired power rights on the North River near St. Adele and in this way will be in a position to serve growing industrial centres iike Ste. Agathe, Piedmont, St. Margaret, Ste. Adele, Shawbridge and other places. It is understood that Hon. Athanase David, who is the member for the County in which the new development will take place will be one of the officers of the new company.

Mount Forest, Ont.

The installation of the tie line of the H. E. P. C. of Ont., between Niagara and Eugenia Systems—Mount Forest to Harriston, and the construction of the sub-station and installation of the frequency changer set at Mount Forest are progressing favorably. It is anticipated that the entire work will be completed soon.

North Gower, Ont.

In accordance with a request from the Township of North Gower, rural meetings have been held in the villages of North Gower and Manotick to consider the question of extending the Nepean Rural Hydro district and serve this territory with power from Ottawa.

Ottawa, Ont.

A sub-committee of the Cabinet Council, consisting of the Ministers of Public Works, National Defense, Trade and Commerce and Marine and Fisheries, has been appointed to consider the feasibility of consolidating under one control or department the administration of Government services in connection with wireless, cable, telegraph and other means of communication. At present, each of these departments has under its jurisdiction one or other branches connected with wireless, cables and telegraphs, resulting in some overlapping of jurisdiction and unnecessary expense of administration.

Wireless communication between Dawson City and Mayo, in the Yukon territory, is promised by the Department of Defense by the end of the year. Major W. A. Steel, Canadian Signal Corps, is en route from Ottawa to Dawson City, where he will erect the first wireless station, and the new mining camp at Mayo will be connected up immediately. Next year, it is proposed to continue the erection of a chain of radio stations in the Mackenzie Valley, connecting with the Dawson station, and thus giving telegraphic communication from the Yukon to Alberta via McMurray. The northernmost station will be at Aclavic, on Mackenzie Bay. The Canadian Signal Corps is manufacturing the transmitting and receiving apparatus and supplying personnel for duty at the new stations. The transmitters used are of the continuous-wave, vacuum-tube type.

Petrolia, Ont.

L. L. Craig, formerly manager of the Stamford, Ont., hydro system, has been appointed manager of the Petrolia, Ont., hydro-electric system.

Preston, Ont.

The new 750 kv.a. transformer which the Preston, Ont., Light and Water commission recently purchased in St. Catharines, has arrived in town, and R. Barrette, superintendent of the water and power plant is directing the unloading. It was ordered by the town owing to the increased demand for power.

St. John, N. B.

The Civic hydro commission of St. John, N. B., let contract to the Canadian General Electric Co. for 50 meters at a total cost of $2,387, and to Lindsley Bros. for 500 cedar poles for $3,075.

Clarence McNaughton Steeves, B.Sc., has been appointed construction engineer of the N. B. Hydro Commission, under direction of acting chief engineer S. R. Weston. Mr. Steeves, who has made his home in Fredericton for some time, went to St. John yesterday to take up his new duties.

The new dams on the Musquash will be sufficiently advanced to be closed about the middle of Sep-

tember and it will then be possible to store water in the head dam on the West Branch.

St. Thomas, Ont.

Construction work has been started in St. Thomas, Ont., rural Hydro district, rebuilding old rural lines and extending them. When completed, service will be given to 162 consumers, in addition to 319 who are served by the present lines.

Sarnia, Ont.

Construction work has been completed for a rural Hydro line from Sarnia to Corunna and Stag Island, to serve 95 rural consumers. Plans are under way for extending this line to give service to the village of Courtright.

Sherbrooke, Que.

The city council of Sherbrooke, Que., is having plans prepared for the reconstruction of the Frontenac power dam with reinforced concrete, work to be undertaken next spring at an estimated cost of $20,000.

Spencerville, Ont.

The village of Spencerville in the Prescott Rural Hydro District has its new street lighting system in operation.

Timmins, Ont.

The decision of the Hollinger Consolidated to hold mill enlargement in obeyance pending completion of its own power plant on the Abitibi River, holds out good prospects of permitting all the mines of the Porcupine district to go through the season without as much danger as would otherwise have presented itself of another power shortage during the coming winter.

Toronto, Ont.

Application has been made to the Harbor Board by the Ontario Provincial Toronto Hydro Commission for permission to construct a tower transmission line on the Lake Shore road from Jane street to Parkside Drive and thence to the sub-station at the foot of Strachan avenue.

Vancouver, B. C.

Radio will be installed this winter to increase efficiency of the Vancouver unit, Royal Canadian Air Force, in the flying season of 1924. Wireless equipment will be installed at the Jericho Beach station here, and in the flying boats, which will enable the pilot of each seaplane to be in constant touch by speech with his base station.

West Vancouver, B. C.

An extension of the lighting system of West Vancouver which was recently installed by the B. C. Electric Railway Company this summer, is planned to Caulfeilds and Cypress Park. A number of the residents of this neighborhood have petitioned to the company and as soon as possible a by-law will be voted on by the property owners of the district, giving the company a franchise under the same terms as those covering West Vancouver.

Windsor, N. S.

Windsor Light & Power Co., who have been operating by steam up to August 21, 1923, are now getting power from a hydro-electric development. E. P. Mosher is the superintendent of plant and equipment.

Windsor, Ont.

G. S. Whelpton, 856 Hall Ave., Windsor, Ont., has secured the electrical contract at $2,496 for a separate school to be erected on Campbell Ave., at cost of $160,000.

Wiring Contracts Awarded

Baden, Ont.

B. Lederman, $6,000 house.

Burlington, Ont.

Kelly & Bray, Hamilton, Ont., $25,000 house.

Brantford, Ont.

.. T. J. Minnes & Co., $75,000 school.

Edmonton, Alta.

Economy Electric Co., $1,586 wiring contract on $62,855 addition to Nurses Home.

Collin Allan, $876.00 wiring contract for $17,000 laundry and root house.

East Kildonan, Man.

Gordon Electric Co., 2 residences, $3,000.

Humberstone, Ont.

Jack Livingstone, Port Colborne, Ont., $4,000 house on Thompson St.; $5,000 house on Cranberry St.; $3,500 house on Humbolt St.

Hornepayne, Ont.

Grant & Hiscock, school building.

Leaside, Ont.

Mechanical Trades Co., Toronto, $44,000 school.

Lunenburg, N. S.

Lunenburg Gas Co.; $25,000 Masonic temple.

Long Branch, Ont.

J. McNeice, $10,000 garage at stop 27, Lake Shore Road.

Mimico, Ont.

Warner & Fordyce, $3,600 house on Eastbourne crescent.

Mount Rolland, Que.

J. A. St. Amour, Montreal, $33,000 school.

Moncton, N. B.

Moncton Plumbing & Supply Co., $4,500 house on Church St.

Montreal, Que.

E. B. Evans, $8,000 factory 33 Lenoir St.

E. Monnette, 2 stores and 6 apartments $25,000, on St. James St.

A. E. Gregory, semi-detached residence $12,000 on Wolsey Ave.

Vincent & Say, alterations to residence on Peel St., $30,000.

Briard & Houle, 2 houses corner Albany and Gatineau Sts., $12,000.

Romeo Noel, $8,000 house on Orleans St.

L. A. Bergeron, $7,000 house on Casgrain St.

J. A. Roy, 28 houses $150,000, on Redpath Ave.

P. Houle, 2 houses $16,000 on Connaught Ave.

W. Rochon, church basement, 1854 Notre Dame East.

L. Beaudry, $14,000 house near 3300 St. Lawrence Blvd.

S. Golding, $10,000 apartments, 73a St. Famille St.

L. C. Barbeau & Co., Ltd., $90,000 apartment house, Atwater & St. Luc.

New Hamburg, Ont.

Geo. Morley, $7,000 house.

North York Twp., Ont.

Porter & Clark, Toronto, $5,925 school.

Oakville, Ont.

B. E. Sprowe, $46,400 school; $5,000 house on Colborne St.

Ottawa, Ont.

Chas. Wallace, $6,000 house on Huron St.

Norman Young, $4,000 house on Smirle Ave.

L. Richard, $5,000 house on Nelson St.

J. W. Ellacot, $4,200 house west side Smirle Ave.; $100,000 apartments on Armstrong St.

J. Young, $5,000 house on Hamilton Ave.

H. L. Allen, $4,000 double residence on Bell St.; alterations and addition to residence $5,000, on Somerset St.; altering residence into apartments $9,000, on Albert St.

Oshawa, Ont.

Canada Electric Co., Toronto, assembly building and shipping shed of General Motors of Canada, Ltd.

Port Credit, Ont.

G. McNeice, $5,000 residence on Aviation Road; $5,000 store and apartment, stop 34½ Lake Shore Road; $5,000 house onMinewawa St.

J. MacMahon, $6,000 house; $6,000 house on Mineola Road; $6,000 house on Cumberland St.

Mr. Moore, Centre Road, Port Credit, 12 semi-detached houses on Elmer Ave.

Quebec, Que.

J. B. Morin, $14,800 cottage on Grande Allee.

Jobin & Paquet, toilet building, Champlain dry dock, at $8,000.

Sault Ste. Marie, Ont.

Taylor Bros., $4,000 house on John St.; 3 store block $15,000.

J. H. Stearns, $4,000 house on Gordon Ave.

Ste Therese, Que.

Goudreau & Frere, $10,000 cottage.

Stratford, Ont.

J. Brandy, $4,000 house on Norman St.

Bennington Electric Co., addition to residence for Nuns Home.

St. Catharines, Ont.

A. B. Cudney, $4,000 house corner Haig and Dufferin; $4,500 house at 26 Louisa St.

C. Widdicombe, residence.

St. Johns, Que.

O. Caron, 464 Lasalle St., Montreal—$6,000 alterations to church.

Toronto, Ont.

Moss & Stocks Electric Co., $15,000 house on Mt. Pleasant Rd.

Clarke & Porter, residence on Brookdale Ave.

N. McLeod, $4,000 house east side Coxwell Ave., near Milverton Blvd.; $5,000 house 780 Coxwell Ave.

R. A. L. Gray & Co., $50,000 church, corner St. Clair and Bracondale Ave.

Verdun, Que.

E. Robillard, $9,000 house on First Ave.

Mr. Dionne; Newmarch, $5,000 house near Allen St.

Vancouver, B. C.

Jenkins Elec. Co., remodelling block for public market at 25 Hastings St. W.

York Twp., Ont.

J. B. Forsey, 159 Wychwood Ave., Memorial school (Fairbank).

The Largest Automatic Motor Generator Set

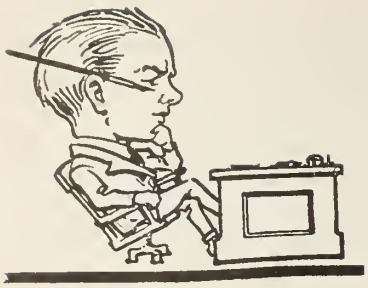
The Union Electric and Power Company of St. Louis has ordered from the Westinghouse Electric & Manufacturing Company a three unit 3750 kw. automatic motor generator set, the largest automatic motor generator set yet built. All the parts of the machine are standard and have been built for manual operation, but complete automatic operation has heretofore been used only with smaller machines. The set will be used to supply current to the Edison system of the company in the downtown districts.

Dalyte Tipless Lamps

The Dalyte Electric Limited, Guelph, Ont., are marketing a new lamp known as the "Holo-Stem." This lamp is tipless, and the construction is claimed to eliminate all glass stresses. It is constructed in all types and sizes from 5 to 1000 watts.

A Travelling Electric Store

The Bancroft Electric Company, Worcester, Mass., recently completed a unique campaign for advertising washing machines, ironers and other appliances. A travelling show room was constructed on a motor truck and the residential streets of the city were visited nightly for a week. No attempt was made to sell from the truck, but excellent results were secured from follow-up work later.



The Editor Comments

Fall Business May Prove Turning Point

Every spring we look forward to better business in the fall, and every fall we look forward to better business in the spring. We've been doing that for several years, and, putting it plainly, our expectations have not been realized. We're able to keep business moving, but for some reason—to the root of which we'd like to get—the progress on the upgrade is disappointingly slow. One assurance at least we have, that we have reached the bottom. Indeed we have been travelling along it for a year or more, and everyone is agreed that it's about time we came up for air.

We are now entering upon a fall season which may or may not prove to be the turning point. We have passed so many turning points in recent years that the conviction is forced home upon us that we have been travelling in a circle. At any rate there hasn't been much change of scenery. Still we keep on hoping that there are better things around the corner. Eventually there will be. We can afford to be optimistic as long as we keep at work.

The fact is that not many people are making profits these days, but most of us seem to be making a living, which is a very fortunate situation, when we begin to compare ourselves with some of our European neighbors. We'd like to see things leaping ahead of course, but we will have to content ourselves with a gradual improvement—and a general improvement is the only safe basis of progress at the present time. Canada cannot expect an exuberance of commercial and industrial activity while the world in general is just convalescing. This country is little affected, if affected at all, by the diseases that have caused the world's troubles, but while the body of the nations has certain of its members in splints and many grievous wounds in process of healing on various portions of its anatomy, we, though apart from the directly affected areas, cannot expect to have the same freedom and rapidity of development as if the whole earth were on its feet and in the best of health.

Still things are improving, slowly but surely. Conditions in England, from latest reports, are on the mend—which is the surest index of the international business situation. What Canada needs more than any other one thing is a market for her wheat at a fair price. Apparently we may expect a big crop, but that does not guarantee all the beneficial effects desirable, unless the price is sufficient to pay the farmer for his labor and net him a profit which will allow him to enter the market as an active purchaser. As the international trade situation improves we may expect a readier market for our wheat at better prices. The price has been kept down largely because many of the European nations simply could not afford to buy wheat.

At any rate the crop prospects have created a better feeling throughout the country, which in itself is very helpful and, while perhaps we may not see that "marked improvement" in business generally which we may have been hoping for, there will be further definite progress toward a sound and permanent trade development.

Still Cutting Under

In conversation recently, a prominent electrical contractor, who is constantly doing fair sized jobs, stated that he was often pestered by people who tried to find what his bids would be on future work. In fact, he says that it has got to a point where when he is figuring on a job, and he suspects he is being fished for information, he casually mentions a figure that will be well above his intended bid, as a means of self-protection.

This statement reveals an interesting state of affairs. It means that there are men in the business, even in a fair way of business, doing big jobs, who are either incompetent or too lazy to figure their own bids. They are out to do business on the cut price principle, to get the other fellow's figure and cut under him.

This information is supplemented by reports from other sources, from equally reliable contractors. They state that time and again they have turned in bids on wiring jobs that were figured down to a point where they could go no lower and break even, only to have the contract awarded to someone else. Now, the point they make is, the man who got the job must have lost money.

These things indicate a state of affairs which require a remedy, and the only remedy appears to be education.

The Toronto Licensing By-law, and similar measures in other places, are steps in the right direction, but they must be supplemented. It seems a mountainous job to persuade a price-cutter, or an incompetent, to change his ways, but persistent effort will

do it. There seems to be a spirit of fellowship, or humanity, creeping into business at the present time, as opposed to the "efficiency" idea of a few years ago, and it may be that the larger introduction of this spirit into the relations of electrical contractor-dealers would foster better conditions.

Gingering up a Sales Staff

Greater initiative on the part of the sales staff would go a long way toward solving the difficulties of the retail market. How to secure that greater initiative is one of the big problems of the business. Many retailers hold meetings of their employees in order to create a spirit of enthusiasm and esprit de corps. Not always are they successful, and the employer wonders why he doesn't get his message across. He has the feeling that as they talk among themselves afterwards, their remarks are those that are heard only too often on the lips of salespeople: "Same old stuff!" "What do we get out of this?" "What he wants is more work out of us for the same money, and bigger profits for himself."

Yes, that's the way the average employee talks after a talk by the average employer. It's no easy task convincing salespeople that it is to their advantage to give their best efforts. It's a mighty hard matter to keep them right up to scratch all the time. The commission and bonus systems of remuneration have been helpful, though not all retailers are satisfied with this plan. Salary increases proportionate to sales' increases may also be counted upon as a good stimulant.

There is another factor, however, which is perhaps the most important of all—this is the personal interest of the employer in the worker, his problems and his progress. If the merchant takes a genuine interest in the welfare of his employees, if he can show patience when they are dull, speak the word of encouragement when they are discouraged, and show his appreciation tactfully when they are gaining success, then he will assuredly create an atmosphere of loyalty. When that atmosphere is created, the battle is more than half won. Loyal and enthusiastic salespeople are easily teachable. But it is only when the merchant succeeds in placing himself in the position of the employee, and seeing things from his viewpoint that he can secure that ready and receptive attitude.

Progress on B.C.E.R. Company Development Work

John Davidson, deputy chairman of the board of directors of the British Columbia Electric Railway Company in London, England paid a visit to British Columbia during August. He intimated that the directors of the company were prepared to spend $5,000,000 to $10,000,000 in the near future on extending the light and power, railway and gas systems in British Columbia.

Announcement was also made during his stay of the further plans in connection with the development of 116,000 horse power in the Alouette-Stave scheme. George Kidd, president of the company at Vancouver, states that a start will be made on the dam and tunnel on the Alouette lake at the beginning of 1924, by which time full approval of the government is expected to be obtained. The dam at the mouth of Alouette lake will raise the lake 45 feet. The tunnel will be 15 feet in diameter and 4,000 feet in length. Survey parties of upwards of 50 men are now at work.

Contemporaneously with this work, a start is expected to be made on the building for the fifth unit at the present Stave Falls plant. By making use of the difference in level between Alouette lake and Stave lake, some 140 feet, a plant of 9,000 kilowatts or 12,000 horse power, operating at an 80 per cent load factor, will be built. Using the same water a second time, in the fifth unit, there will be an additional 24,000 horse power generated. These two plants will cost $2,500,000. A third plant will be built three and a half miles farther down the river, generating 80,000 horse power and costing $7,000,000. Surveys are now being made for this plant. The future plans of the company are in the hands of E. E. Carpenter, who is now on the staff as consulting engineer.

Work on the Blind Slough Dam which raises the level of Stave Lake 22 feet will be finished about the end of September, in time to conserve the fall rains.

Canada to be Represented in World Hydro Power Conference

A world power conference, in which Canada will play an important part, will be held in London next July, during the British Empire Exhibition. J. B. Challies, Superintendent of Water Powers in Canada, who has been discussing the project with British and American representatives, will shortly return to Canada to organize a Canadian committee. The conference will discuss the establishment of an international bureau to take an inventory of the world's power resources.

Dr. G. A. Culver, chief high frequency engineer of the Canadian Independent Telephone Co., Toronto, for the past three years, has been appointed professor of physics in Carleton College, Minneapolis.

A. MacDonald, who has been secretary to Rey Chatfield, of the Electrical Service League of British Columbia, is now carrying on Mr. Chatfield's duties as secretary-manager, pending the appointment of a new manager.

Facts About Electric Heating

Results of a Special Research on the Application of Electrical Heating Systems to Dwellings—Sizes of Units—Energy Required—Cost of Installation—Limiting Factors

By M. P. WHELEN, M. A. Sc.

During the winter of 1922 the writer made a special study of the subject of "Electric Heating of Dwellings," collecting and comparing all the data then available. From the tables and formula given in the following article, the size of heating units, energy required per season and the size of hot water storage tank (if off peak power only is available) can all be calculated for an ordinary well built house. The costs of a suitable installation are given and the extent to which these may be reduced in the future by better house construction is indicated, together with a brief resume of some of the factors at present limiting the general adoption of electric heating for all dwellings.

Electric heating can be best applied to a hot water heating system with a well insulated hot water storage tank and electric boiler, replacing or parallelling the fuel fired furnace. The hot water storage tank makes it possible to keep the house comfortable for the three or four hours of the peak load period when the power would be turned off. Three immersion heating elements having capacities in the ratio of 1:2:4 would give seven ranges of heat and could be either hand operated by remote control of switches or regulated automatically by means of a centrally located thermostat. Direct or alternating current

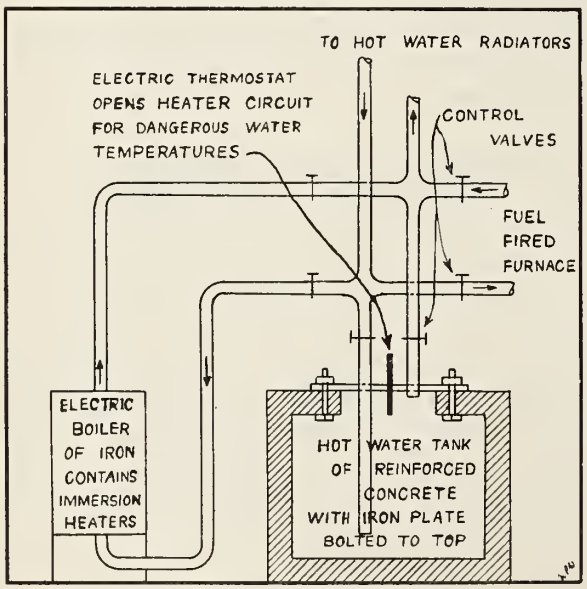


Fig. 1—Connections for electric heating system

could be used and voltages as high as 550 volts would be feasible in a well planned installation. The accompanying sketch shows the general scheme of connections. For efficiency of operation the storage tank, boiler and piping in basement should be thickly covered by a good heat insulating material. Ashes and coarse sand are cheap heat insulators and could be used to advantage in covering the hot water storage tank. The tank itself it much cheaper if made of reinforced concrete rather than of iron. A model tank of super cement concrete when tested was found to be quite water-tight and unaffected by changes of heat for the heating range to be used.

Size of Heating Units

For convenience the size of heating units required will be first worked out for the general case where power is used twenty-four hours a day and these results can then be modified for use where power can only be utilized during off peak hours for heating.

After careful study of the weather records and the capacity in kilowatts actually used to heat several houses successfully, it has been possible to arrive at a unit capacity per 1000 cubic feet of air space to be heated in an average Canadian home. This unit is figured for a seven or eight roomed, well built, detached brick house as 10 watts per 1000 cubic feet of air space per degree Fahrenheit of the maximum heating range. This maximum heating range is taken as the difference between the lowest outside temperature and a normal inside heated temperature of 70° F. Knowing the maximum heating range for a given city, it is easy to calculate the average specific capacity, for that place, as the number of degrees Fahrenheit of heating range multiplied by 10 watts. In the following table the average of the lowest temperature recorded each year in a fourteen year period is taken as the lowest temperature that need ordinarily be provided for.

TABLE I.

Normal Values of Specific Capacity "W" for Canadian Cities

Place	Lowest Temperature recorded 1907-20	Average Yearly Lowest Temper.	Heating Range Degrees Fahrenheit Below 70° F.	Normal Specific Capacity in Kilowatts per 1000 cu. ft.
Toronto	—22° F.	—11° F.	81	0.81
Montreal	—27° F.	—19° F.	89	0.89
Ottawa	—31° F.	—23° F.	93	0.93
Quebec	—32° F.	—25° F.	95	0.95
Winnipeg	—45° F.	—38° F.	108	1.08

Now as in many cases power is only available for electric heating if used off peak, the heating capa-

city needed if the power cannot be used twenty-four hours per day is increased. These results are conveniently expressed in the following formula:—

$$P = \frac{24\,WV}{24 - T}$$

where P = heater capacity in kilowatts for house
W = specific capacity (Table I)
V = thousands of cubic feet of air space in house to be heated
T = number of hours per day of peak load when power would be shut off.

For example: We want to electrically heat a Toronto house having an air volume of 25,000 cu. ft. and the power is shut off for three hours per day. What heater capacity is required?

$$P = \frac{24\,WV}{24 - T} = \frac{24 \times 0.81 \times 25}{24 - 3} \text{ kilowatts} = 23 \text{ kw.}$$

The values of specific capacity as given are average values when no special care is taken as regards the opening of doors and windows for ventilation and where the house is of only ordinary good construction. If no heat were lost through the walls and roof of a house and if we figure on supplying 30 cubic feet of warmed fresh air per minute per person and assume a house of 25,000 cubic feet air volume has five occupants, the unit capacity works out to 1.9 watts per 1000 cubic feet of heated air volume per degree Fahrenheit of maximum heating range. Again if the air were renewed once every hour in this house, the lowest unit capacity would be 5.3 watts per 1000 cubic feet of heated air volume per degree Fahrenheit of the maximum heating range.

Recent medical experiments show that very large percentages of carbonic acid in the air we breathe are not injurious if the air is kept circulating and does not become stagnant. So we see that in the future, with more carefully constructed houses from the standpoint of heat insulation, very low values of specific heating capacity are probable.

Energy Required Per Season

Data giving the total energy consumption for a given sized house with size of heating units used is meagre. Approximately, however, it is found that the energy each month varies in any given installation, with the average number of degrees difference between the outside and inside temperatures. This is shown graphically in figure 2 as is also the variation of the highest maximum demand each month. The energy required per annum for an ordinary house then is—

$$E = 65\ WVR$$

where E is the total kilowatt hours required per season
R is the number of degrees Fahrenheit in the mean winter heating range.
V is the number of thousands of cubic feet of air volume in the house to be heated.

The value of R the mean winter heating range in degrees Fahrenheit can be found from the following table:—

TABLE II.

Mean Winter Heating Range "R" for Canadian Cities

(Based on temperature records in 1917 for)
(Jan., Feb., Mar., April, May, Oct., Nov., Dec.)

Place	Lowest Monthly Mean Temperature	Highest Monthly Mean Temperature	Mean Winter Temperature Winter	Heating Range Degrees Fah. below 70° F.
Toronto	17° F.	49° F.	33° F.	37
Montreal	9° F.	48° F.	27° F.	43
Ottawa	7° F.	49° F.	26° F.	44
Quebec	6° F.	46° F.	25° F.	45
Winnipeg	—8° F.	51° F.	19° F.	51

Suppose for example that we wish to heat the Toronto house previously found to need an installed capacity of 23 kilowatts. In this case—

E = 65 WVR = (65 x .81 x 25 x 37) kilowatt hours = 48,701 kw.h.

As a further example let us take a house of 30,000

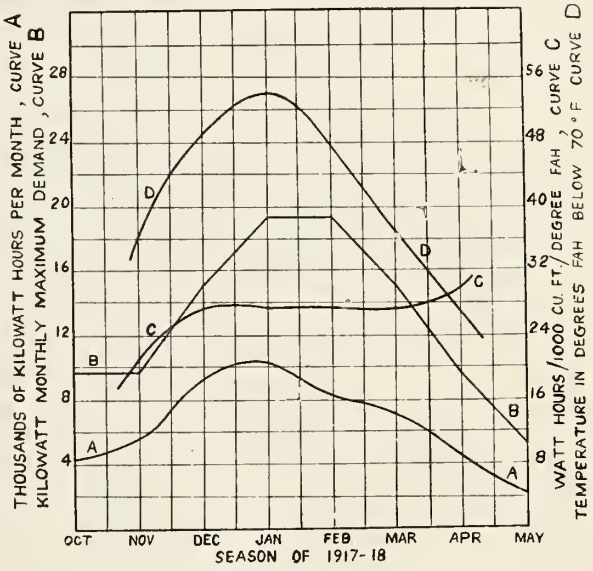


Fig. 2—Showing variation in amount of energy required

cubic feet air volume in Winnipeg where all day power is available. The installed capacity required is—

$$P = \frac{24\,WV}{24 - T} = \frac{24 \times 1.08 \times 30}{24} \text{ kilowatts} = 32.4 \text{ kw.}$$

The total energy required per season is—

E = 65 WVR = (65 x 1.08 x 30 x 51) kilowatt hours = 107,406 kw.h.

Hot Water Storage and off Peak Power

Many people believe that the solution of electric heating of houses lies in the use of off peak power and some system of heat storage. The following curve shows that where power is paid for on the basis of monthly maximum demand that either all day power or power with only a short off peak period must be used.

In addition it should be noted that as the demand

increases the cost of the following are all considerably increased:—

(a) The feeder lines of power company
(b) Electrical equipment in installation
(c) Hot water storage tank.

The size of hot water storage tank required can be calculated from the following formula:—

$$S = \frac{427\,TWV}{re}$$

where S = U. S. gallons storage tank capacity
V = thousands of cubic feet in house
W = specific capacity = kw./1000 cu. ft. needed
T = number of hours of storage period when power is shut off
r = heat storage range in degrees Fah.
e = efficiency of heat insulation.

A maximum heat range of about 100 degrees Fahrenheit is possible with a liberally designed radiator system and forced hot water circulation. With a very carefully insulated tank the heat loss for a three hour storage period is about 5%, but for longer periods would be greatly increased. Hence an efficiency of 95% is possibly the best obtainable value of "e".

The Cost

The annual costs for power and energy depend on the prevailing local rates for electric service. The rates for hydro electric power in Toronto are very low. If the lowest residential rate of 1c. per kw.h. were obtainable, the cost of electric heating in Toronto would be double that with coal at $15 a ton.

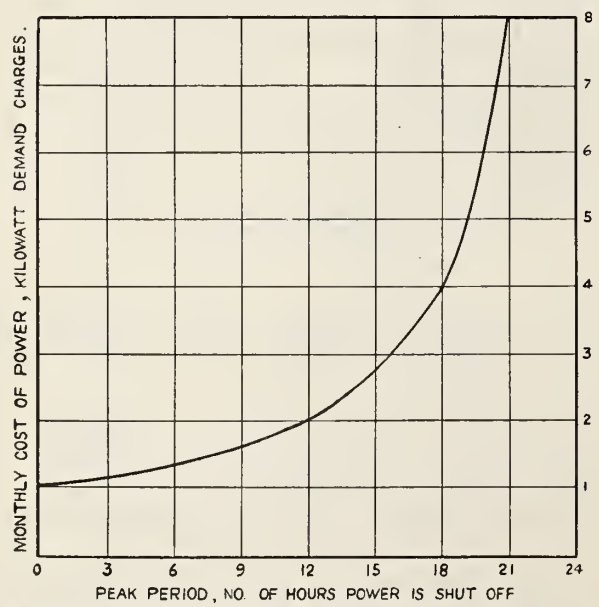


Fig. 3—Showing that all day power or power with only a short off peak period must be used where paid for on basis of monthly maximum demand

The cost of a complete installation varies greatly with the size of house and storage tank to be used. For an average Canadian house with a storage period of three hours, using a tank of reinforced super cement concrete, the cost would be about $500 or $600 including all electrical parts, storage tank and heating elements. If a black iron tank were used instead of the concrete tank, the cost would be increased by about $200 while if no tank were necessary and all day power were available, the cost would be about $300 or $400.

Conclusion

Electric heating of dwellings is at the present time possible to only a limited extent. In Toronto, for instance, if all the available off peak power could be utilized for electric heating, only 1.5% of the houses could be heated electrically. While to heat all the houses of Toronto would require more than a million horsepower in generating equipment which is 3 or 4 times the total amount of electrical power now used in Toronto for all purposes and is nearly double the expected total power output of the Chippawa Development at Niagara. Besides this limitation if electric heating of houses were to become general in Toronto, a rate of 1 c. per kw.h. might not be allowed unless the highest peak demands, during the two or three months of the winter season when power is scarce, were eliminated by the use of auxiliary heat such as a small fuel fired furnace operating in parallel with the electric hot water boiler.

The future holds out better prospects for electric heating. Report No. 10 Fuel Saving Possibilities in House Heating recently issued by the Research Council shows many ways in which houses may be more scientifically constructed to retain heat in winter. With the better planned house of the future values of unit heating capacity as low as 2 or 3 watts per 1000 cubic feet will replace the present value of 10 watts.

Water Powers to Develop 2,000,000 H. P. Within Sixty Miles of Vancouver

Water Powers to Develop 2,000,000 H.P. Discovered Within Sixty Miles of Vancouver, B.C.

Potential hydro-electric development aggregating more than two million horsepower has been located within a radius of sixty miles from Vancouver, British Columbia, as a result of a survey recently conducted. Power surveys were carried on along the Squamish, Cheakamus, Pitt, Lollooet, Chehallis and Chilliwack Rivers and Lakes Harrison and Garibaldi. As the rivers are supplied from Garibaldi Lake, 4000 feet above sea level, which in turn is fed from the glaciers surrounding it, according to the statement of the surveying engineer it is possible to provide for a steady flow through any works erected for power purposes. The underground passage through which the overflow water from the lake flows, comes at an elevation of 3300 feet and is a steadily flowing stream fed all the year around from the glaciers and not dependent on snowfall for its volume.

Refinements in Design Make Possible

Large Hydraulic Turbines

Indicating Great Advances in the Art—Increased Efficiency of Momentous Importance in Super Turbines—Improvement of Test Methods Another Step Forward

By H. G. ACRES, M.E., M.E.I.C.*

Chief Hydraulic Engineer, Hydro Elec. Power Commission of Ontario

On New Year's Day of 1905, in the plant of the Canadian Niagara Power Company, it fell to the writer's lot to bring up to speed, for the officials inspection of the Provincial Park Commissioners at Niagara Falls, Ontario, two 10,000 h.p. turbines, the largest units ever built up to that time. Seventeen years later, it was again the writer's privilege to turn over the first of the five 55,000 h.p. turbines now installed in the Queenston plant of the Hydro-electric Power Commission, at Niagara, the largest capacity units at present in operation. It was this more or less fortuitous combination of circumstances which suggested a subject for discussion.

Not in any sense as a precise definition, but for the purpose of placing a reasonable limit on the scope of discussion, a hydraulic turbine of large capacity may be defined as one having a capacity of not less than 25,000 h.p., and a revolving weight, with the generator, of not less than 200 tons, exclusive of hydraulic thrust.

The above limitation on capacity and revolving weight will serve the double purpose of eliminating from the discussion any consideration of low head installations, and at the same time giving prominence to certain problems which become increasingly serious as the operating head ranges upwards from 70 or 80 feet. As units of the class above defined are rarely installed under heads as low as this specified minimum, the discussion is therefore more or less limited to medium and high head plants.

Where a high operating head is involved, there is always present the problem of controlling hign static pressure in the interests of safety; in most cases there is also the problem of controlling and utilizing the flow characteristics of long pipe lines to insure, not only safe, but practicable operation; finally where a copious water supply is associated with a high head, there enters the problem of safety and efficiency controlling a heavily energized water-column, and handling the immense revolving weight of the modern super-turbine.

Briefly, it may be stated that since the 10,000 h.p. prototype of the modern super-turbine went into operation at Niagara 18 years ago, the subsequent outstanding advances in the hydraulic art have been primarily in the direction of safer operation, not only from the personal standpoint of the operator, but from the impersonal, and hardly less important standpoint of the investor and the customer. Another point worth noting is that these advances had to do almost wholly with contemporaneous conditions, when they first materialized, and their possibilities as related to the present status of the art where more or less a matter of subsequent realization. In other words, these advances did not definitely anticipate the super-turbine, but their successful application to contemporaneous practice made its subsequent development technically and mechanically possible.

*Before A. S. M. E. Convention in Montreal.

Static Pressure Control

Control of static pressure involved in super-turbine water supply is a vital factor in relation to a maximum degree of safety and convenience in aperation, and in continuity of plant output. Obviously the mechanism to exercise this function is a valve, and such a valve, for super-turbine service, must have the following general specifications:

(a)—It must be built in any size necessary to accommodate any conduit, however large.

(b)—It must be designed to operate under any static head however high.

(c)—Its operation must at all times be safe, sure and positive; in opening under full static pressure, and in closing under the most serious plant emergencies, such as the breakage of a wheel-case, or a runaway resulting from failure of governor control.

(d)—It must open and close rapidly, and should have an automatic closing feature to meet the above-mentioned emergency conditions.

Obviously such a specification could not be met by any valve of the ordinary type, nor was it met until the advent of the Johnson automatic plunger valve. It is not within the scope of this article to enter into a detailed description of this valve and its operating principle, suffice to say that it is now an indispensible adjunct to super-turbine installation, and constitutes one of the advances in the general art which contributed to the possibility of present day super-turbine development. As it now stands, the Johnson valve is an adequate mechanism embodying the ideal elements of simplicity, efficiency and serviceability.

Flow Control

In the majority of cases the development of a high head involves the use of some type of closed pressure conduit of considerable length. In the case of an automatically governed plant where the ratio of head to length of conduit is more than about 1:10, certain phenomena become manifest which constitute a serious menace to safe and practicable operation. The continuous rejection and pulling on of load increments causes recurrent surges throughout the length of the conduit, which, if not damped out or relieved, will sometimes multiply and become superimposed to such an extent as to cause pressures enormously in excess of the static head. This condition, in conjunction with the conversion of pressure

into velocity head for acceleration purposes, when a large increment of load is pulled on, will impose a duty on the governors which are not intended to perform, and where long closed conduits are used with turbines gated beyond the point of maximum efficiency, as they nearly always are, a condition may obtain which is entirely beyond the regulating function of the governor.

The power-discharge curve for the ordinary turbine will show a maximum production per second-foot at the point of best efficiency, and the first derivative of this curve will show a rapidly decreasing rate of production per second-foot from that point to full gate. Consequently, every horse-power pulled on in excess of best efficiency capacity will require a rapidly increasing amount of water to produce it. If therefore, the turbine is operating at or beyond the point of maximum efficiency, when the system demands a large increment of load, there will be a falling off in production per unit of water supplied and coincident therewith a loss of effective head, due to the absorption of such velocity head as is necessary to accelerate the water-column. During the period when the water-column is accelerating, it is therefore evident that a condition may obtain where the output is actually falling off while the water input is increasing, the result being that the governor may open the gates full-stroke in response to the falling speed, at which point its controlling function will cease until either the system "wr²" holds the unit, with dropping frequency, for the space necessary for the governor to gradually resume control on rising speed, or until the generator drops its load and the turbine jumps to runaway speed at full gate, with possible disastrous consequences.

Insofar as the control of surge pressure is concerned, it is evident that if no practical limitations are placed upon it, in the matter of diameter and height, the ordinary standpipe would be an ideal corrective agency. It is clear, however, that in the case of a super-turbine installation, unrestricted scope in design is wholly impracticable from the standpoint of both cost and space limitation. On the other hand a simple standpipe, feasibly designed and located, may at times actually make more acute the conditions it is designed to correct or alleviate. This is due to the fact that the simple standpipe can only passively absorb surge pressure, with its recurrent phases, and for this reason often acts as an agency for superimposing, one upon the other, pressure waves generated by successive changes in load.

Another obvious expedient under this head is to limit the range of velocity change in the conduit by means of a synchronous by-pass, actuated by the governor mechanism. This contrivance can be adjusted to prevent the occurrence of disruptive pressures in the conduit, and also to supplement the influence of the system "wr²" in holding the unit within the regular range of the governor when the unit is pulling on or rejecting load. In this connection it is to be noted that the condition under discussion has not necessarily to do with the maximum conduit velocity at any one time, but with range of change in conduit velocity over a short period of time, and with the absorption and building up of head energy induced by these changes, within their low and high limits.

The synchronous by-pass therefore has a useful function, but in the case of a high head super-turbine installation, its usefulness would be largely discounted by its cumbersome dimensions, its waste of water, and an added mechanical complexity which should be avoided whenever possible as a matter of principle.

The discussion under this head has now reached a stage where it is possible to define the specifications of an ideal surge control agency.

(a)—It should have the effectiveness of a simple standpipe of very large dimensions, without its cost and space requirements.

(b)—It should be capable on the one hand of preventing, or counteracting the effect of, any undue absorption of head energy when load is pulled on, and on the other hand of preventing or counteracting the effect of, any serious recurrent surge pressures arising from load rejections, whether isolated or successive.

(c)—The water surface should be sufficiently

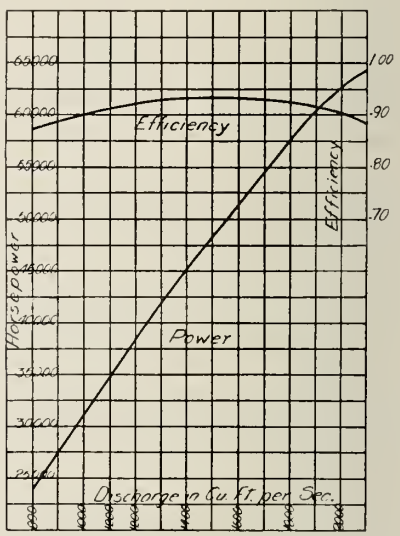


Fig. 1—Efficiency and power discharge curves for one of the Queenston turbines

active to prevent freezing in ordinary low temperatures, and the dimensions should be such as to allow feasible and effective frost protection against extraordinary low temperatures.

(d)—It should operate without wasting water.

(e)—It should be mechanically simple, with a minimum of moving parts and adjustments.

(f)—It should be entirely dissociated from the governor mechanism, leaving the governor free to perform its own peculiar and highly important function, which is to control the speed of the generator, and not the vargaries of the water-column.

This specification has been met with a large degree of effectiveness by the most wholly original, and at the same time one of the most useful contrivances ever developed in the field of hydraulic engineering; namely, the Johnson differential surge tank. For those who are interested, ample published data are available concerning the structural details and operating principle of the Johnson surge tank, and for the purpose of this discussion it is only necessary to state that this contrivance constitutes another of the essential advances in the hydraulic art which have made possible the development and safe operation of the super-turbine.

Revolving Weights

The handling of the revolving weight of a modern super-turbine is governed largely by consideration of efficiency, a matter which will be discussed

later, only the mechanical aspect of the problem being considered at this time.

The devlopment of the art under this head exemplifies a condition often met with in the field of engineering, where an inherently sound principle, after being supplied in a primitive way suffers a period of eclipse through arrested development, and perhaps years afterwards is rediscovered, and becomes the basis of the ultimate solution.

In the early days of hydraulic development the stepbearing, a form of combined thrust and guide bearing located under the runner, was used almost exclusively for support of the revolving element. The subsequent gradual increase in the efficiency, speed and capacity of turbine runners then began to introduce problems of pressure intensity, depreciation and accessibility, which the designers of that day solved, not by improving the step-bearing principle, but by abandoning it, and inaugurating, as a result, the era of the horizontal shaft-turbine. This led to advanced development in bearings of the pillow-brock type, together with the introduction of marine type thrust bearings to take up unbalanced runner thrust, a double requirement which gave rise to serious problems when the development of electrical generation and transmission called for continuously increasing turbine capacity and speed. The 20 000 h.p. horizontal turbines in the plant of the Ontario Power Company at Niagara Falls fairly represent the climax of this trend of development, with water-cooled pillow-block bearings of the enormous dimensions necessary to keep bearing pressure within safe limits, and rotor shafts having a diameter far in excess of torsional requirements, simply to minimize deflection.

The original turbines installed in 1896 by the Niagara Falls Power Company represent the first reversion to the primative basic principle. They were the super-turbines of that period, and were of the vertical shaft type. The revolving weight of these units was partially suspended from, and partially superimposed on a step-bearing located above the runner and immediately below the generator, thus removing one of the main disadvantages of this type of bearing, that of inaccessibility. A further important innovation was the application of external pressure to a film of oil which was forced in between the moving and stationary elements of the bearing. This oil was usually supplied by gear driven triplex plunger pumps at pressures varying from 80 to 350 lbs. per square inch, and maintained an oil film from two to four-thousands of an inch thick between the bearing discs.

The oil pressure thrust bearing had a vogue of many years' duration, and some bearings of this type are still in operation. Their disabilities are: expensive investment and maintenance cost, mechanical complexity, and high temperature, resulting in low oil viscosity and high energy. Also, even a momentary failure of the pressure oil supply usually results in the loss of the bearing.

Finally, there came the ultimate conception, based on the simple and true embodiment of a basic principle, first established by the experiments of Tower in 1883, and afterwards mathematically demonstrated by Reynolds. It remained for Kingsbury to exemplify this principle in a mechanism which is one of the most outstanding examples extant of the simple and efficient application of a natural law.

The Kingsbury type thrust bearing has the following characteristics which distinguish it from its oil-pressure prototype, and make it an eminently suitable mechanism for supporting, in motion, the revolving weight of the modern super-turbine.

It can be adapted to safely support the revolving weight of the heaviest turbine, within feasible dimensional limits.

The source of oil supply is static, and integral with the bearing itself.

The oil supply is "unlimited" in the sense necessary to conform with the laws of motion of viscous fluids, as ennunciated by Reynolds.

The formation of the "pressure wedge" is not induced by any external agency, but by the motion of the bearing itself, and by providing for a very slight lack of parallelism between the stationary and moving elements.

The wedge pressure is a direct function of the speed of the moving element, and the thickness of the oil film is a direct function of the degree of viscosity of the fluid, and consequently of fluid temperature, which can be regulated within any desired limits by the simple expedient of water-cooling coils.

In a recent action involving the Johnson valve, the trial just stated in the text of his decision that this valve was a "combination of elements beautiful in simplicity and highly efficient in operation." His observation applies with equal force to the Johnson surge tank and the Kingsbury thrust bearing, besides constituting a very concise general definition of the perfect mechanism.

Apart altogether from their very material contribution to operating efficiency, the mechanisms above

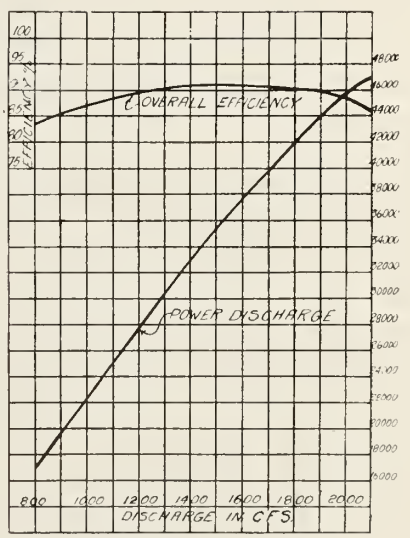


Fig. 2—Overall switchboard efficiency of a Queenston turbine

discussed introduce a factor of safety and dependability, either singly or in combination, without which the present day status of super-turbine development would have been unattainable.

Refinements in Design

In classing the turbine governor under this head the question would naturally arise as to whether or not the governor should not be classed as an essential advance in the art, which, of course, it is. The point is that the items above classified as essential advances were radical departures from contemporary practice, and actually opened up the possibilities of super-turbine development, whereas the turbine governor was enlarged and improved more or less synchronously with the enlargement and improvement of the hydraulic turbine, and to meet the constantly increasing

importance of the duty it was called upon to perform.

As the primary requirement of governor operation is precision and reliability, the natural trend of design has been in the direction of simplicity in principle, the reduction of lost motion by the use of a minimum of moving parts, and precise shop work. An interesting development along this line is the White shaft governor, where the centrifugal element is attached direct to the main turbine shaft, thus obviating the complication of a belt or gear drive for the fly- balls.

The double compensation principle, with the restoring mechanism and load limiting attachment, appears to meet all requirements of super-turbine control adequately and safely, and speed regulation is assured within safe operating limits for all gate movements up to the full stroke of the servomotors.

Remote switchboard control has also been developed to such a stage that there is considerable latitude as to the location of the actuator, which in some cases is now placed directly over the servomotor cylinders, in others on the machine room floor, and sometimes on the switchboard gallery.

A useful adaptation of the Johnson valve principle has been devised by Taylor for interchanging governor and hand control. Two sets of plunger valves are used, one set on the governor and one on the hand control, and the throwing over of one hand lever will simultaneously close all the governor valves, and open all the hand control valves, or vice-versa.

This operation can be carried out in such a short interval of time that there is little or no chance of losing control of the turbine, and no chance whatsoever of interfering with the proper sequence of operation.

One of the latest innovations in governor design is a motor driven centrifugal element, the motor being located in the fly-ball spindle, and synchronously actuated by the main generator. This device serves the same purpose as the shaft governor in that it eliminates the belt or gear drive.

The activity which has manifested itself during the last four or five years in draft-tube investigation is directly traceable to the vogue of the super-turbine. There are two main reasons for this; first, because the large concentration of power in a super-turbine permits an appreciable increment of useful power to be reclaimed as the result of a gain of only a fraction of a per cent in overall efficiency; and second, because vibration resulting from vortex action and unsteady vacuum becomes magnified in the super-turbine to such an extent as to often cause serious inconvenience in operation. The pioneer development under this head was the White hydraucone, which marked a distinct advance in this branch of the art.

Briefly, the two-fold object of recent draft-tube experimental research has been to regain as much as possible of the whirl component of the velocity head in the runner discharge, and to devise means of so training the combined axial and whirling flow, through appropriately designed water-passages, as to minimize conditions giving rise to vibratory effects. All experiments carried on along this line by the principal turbine builders have definitely proved the inadequacy of all forms of the elbow type tube, and have developed a series of types, more or less co-related which have given satisfactory results when tested under operating conditions. Of these types the Moody spreading tube seems to conform most nearly to one's conception of the condition to be met. This is particularly the case in respect of a cone in the centre of the Moody tube which extends from the invert to the lower extremity of the runner hub. Inasmuch as this cone solidly fills the region of maximum turbulence, it seems entirely reasonable to assume, even without experimental confirmation, that it will be effective in preventing cavitation, and the formation of vortices, with their resultant vibratory effects. Serving this purpose it also naturally follows that it must affect a useful conversion of the hitherto wasted whirl energy of the central zone, realizing thereby a gain in efficiency as well as a betterment in operating conditions.

In a small high head plant with which the writer had something to do, the turbine showed 85% efficiency on acceptance test. A year later the efficiency

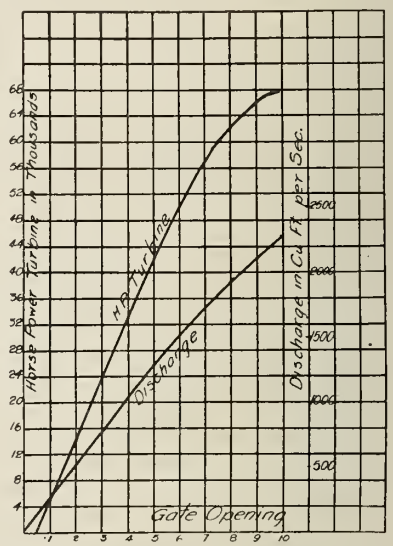


Fig. 3—Curve representing first derivative of the power discharge curve of a Queenston turbine

had dropped to 67% by reason of excessive leakage through the runner clearance spaces. The head in this case was 550 feet and the circhmference of the clearance spaces was about 14 feet. In the case of the 55,000 h.p. turbines at Queenston, the head is about 250 feet less, but the circumference of the runner clearances is about 65 feet. It is evident therefore, that in the case of a runner of this size, under such a head, the leakage factor is a serious matter. As a matter of fact, two of the most recent refinements in turbine design have been devised for the express purpose of meeting this condition; namely, the so-called "labyrinth seal" for preventing leakage through the runner clearance space, and the Overn disc for preventing leakage through the gate clearances.

Instead of the ordinary simple seal consisting of a straight annular passage past the crown of the runner into the space under the head cover, and a similar passage past the runner-band into the draft-tube, the labyrinth seal consists of a series of alternately expanded and contracted passages which destroy the velocity head, and reduce the head on the final free jet to one-third of its initial value.

The Overn disc functions by introducing into the clearance space between the end of the gate veins and the distributor plates, an obstruction to the leakage flow, considerably greater than the diameter of the gate shanks,thus effectively reducing the leakage at these points.

(This article will be concluded in our next issue)

Retail Marketing Tips

Washing Machines

—And How to Sell Them



Get Your Fair Share at Your Annual Fair



THOUSANDS of folks visit your local fair every year. Nominally, they come to see the fruits of the field and the orchard that are gathered together, but actually they are buyers on a Fall scouting trip.

For these folk, every year the "go-get" dealers are concentrating more and more on their Fair displays. They are paying heavy rent for down-town stores, where thousands of people pass the windows every day. Following the same reasoning, they believe in taking advantage of the crowds at the Fair to put on a live washing machine display.

It's up to you this year. Remember that any action display will go big. The "Old and New Way" or the "Wife Preserver" stunt at your booth will put the message across.

"He had been selling about one a month. Then we urged him to make a special effort, and his sales jumped to from five to ten—we believe the same applies almost anywhere."

The Sunnysuds is riding on the greatest wave of popularity ever experienced by a household appliance

And this success is all the more phenomenal when you consider that the Sunnysuds has been on the market but little more than three years.

From coast to coast, Sunnysuds popularity is increasing in momentum and making the cash registers ring in a thousand dealers' stores. It is a pity if you are not sharing in this profitable selling proposition.

At least, you owe it to yourself to investigate its merits. All that is required is a post card, saying you are interested and full details will be promptly forwarded. It incurs no obligation whatever.

ELECTRIC EQUIPMENT

Powerful ¼ H.P. electric motor, self cooling and splash proof. Controlled by new automatic switch, which makes the Sunnysuds absolutely fool-proof. It prevents overloading, prevents blowing fuses, and saves time and expense. When the Sunnysuds is expected to do something beyond its capacity, the switch automatically cuts off the current.

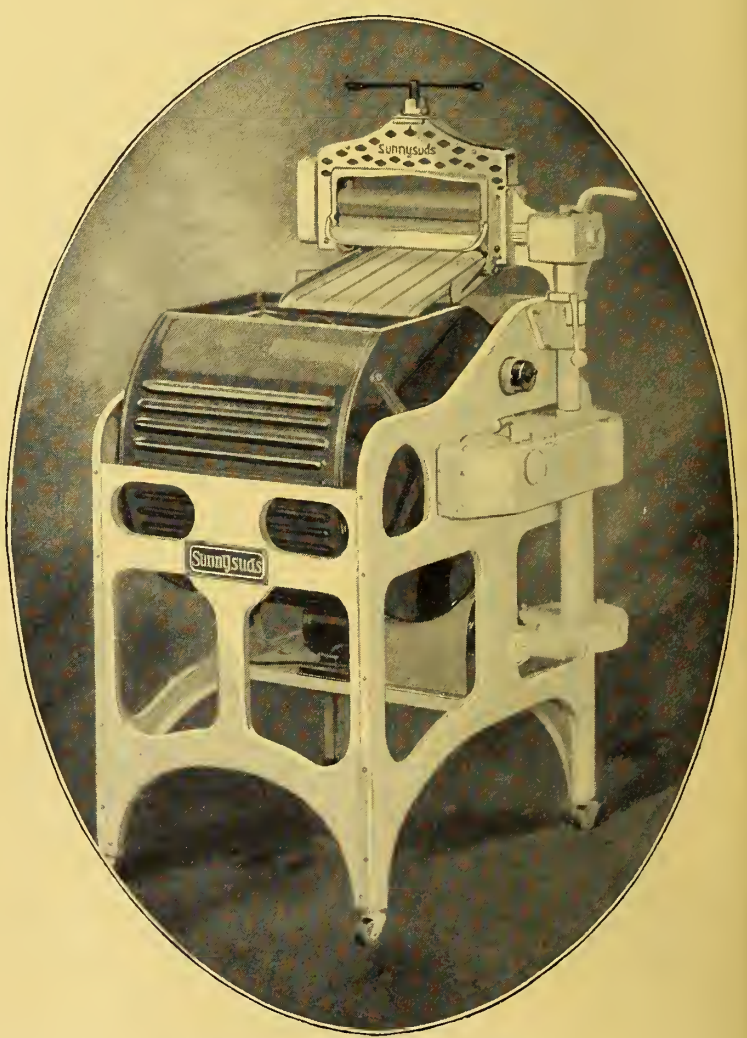
ONWARD MANUFACTURING COMPANY
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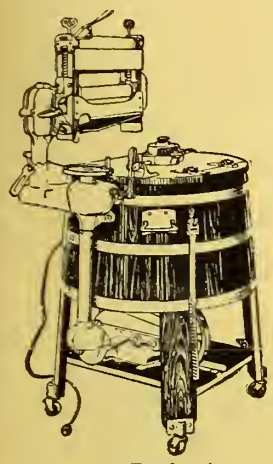
Sunnysuds scores veritable triumph

It was quite evident that a large percentage of the thousands who surged 'round the Sunnysuds exhibit came with the definite object of getting first-hand information about this machine. The interest they evinced—the orders they placed—foretell beyond a shadow of a doubt that Sunnysuds dealers will experience even better business this Fall and Winter.

The exhibit was a success in every way—why not cash in on it?



There's an Electric Washer to Suit Every Prospect in the Famous Connor Line

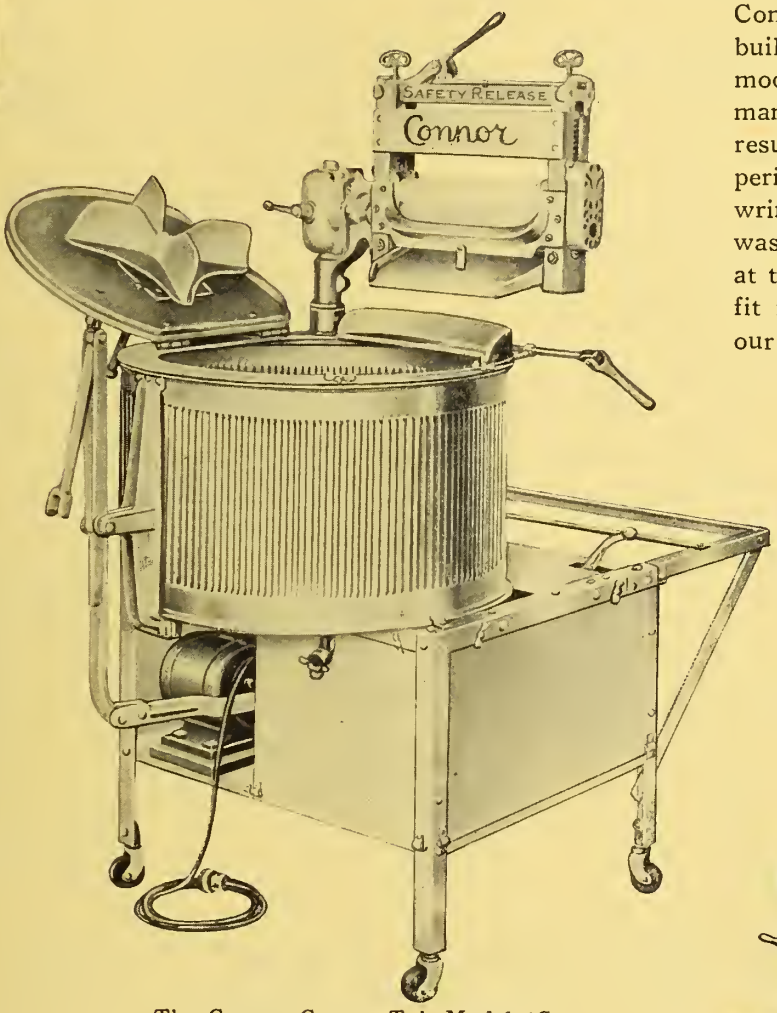


Connor Perfection Electric Swinging Wringer

See This New One

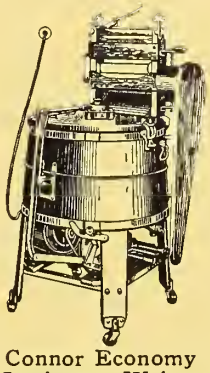
MODEL 4C

This latest addition to our line is filling a long-felt want. It possesses many special features—polished copper tub and polished aluminum cover, polished aluminum feed board and drain board of 12" swinging wringer, extension folding bench—these and many other special devices make an instant appeal.

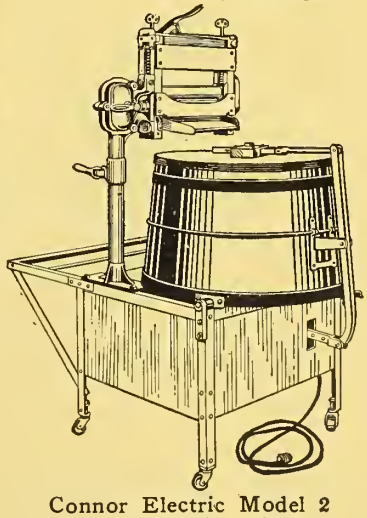


The Connor Copper Tub Model 4C

Connor Electric Washers built in four different models, meet every demand. They are the result of long years of experience in washer and wringer building. Every washer guaranteed. Look at the prices, a good profit for dealer shown, get our trade discounts.



Connor Economy Stationary Wringer



Connor Electric Model 2 Wood Tilting Tub Swinging Wringer

Mr. Dealer-- Ninety-Five out of One Hundred women you talk to, in your store or through your ads., use the dolly type hand or water power washer. When you show them the Connor four winged dolly, they know, from experience, you are right. Why not recognize the advantages of our four, different, models operating on same principle, meeting the buying ability of different people.

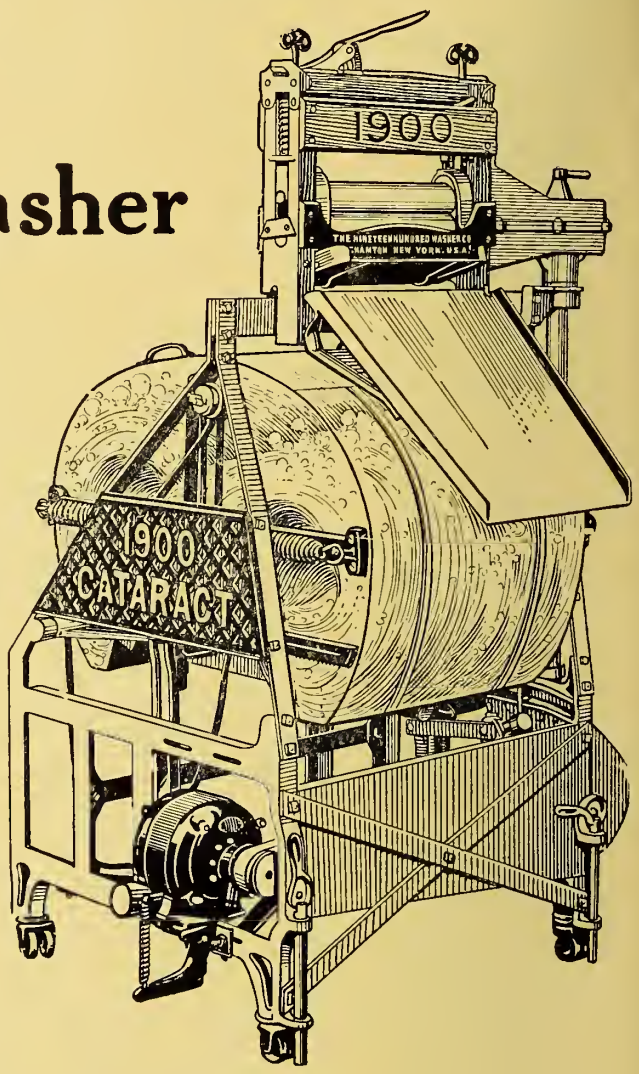
J. H. Connor & Son Ltd., Ottawa, Ont.

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for Dealers who want to sell the best

"1900"

the Cataract Washer



"Cataraction" is a mechanically correct washing principle which has never been successinitated for the following reasons:

It has a side to side motion of 6½ inches and an up and down motion of 11 inches. Its curved interior and shape of bottom is an exclusive design which produces the following effect:

The water takes on wonderful life and power, gets over and under and through the clothes. Clothes are turned over repeatedly, 42 times at one end and then 42 times at the other end with the sudsy water.
Result—Clothes washed in half the time.

These are reasons why the "1900 Cataract" is selling so big and why dealers are signing up from coast to coast to handle it.

Get full particulars on our proposition today. We have sales helps and a Free Advertising Service for our dealers.

Some of the "1900" Points of Superiority

Power transmitted from motor mounted on swinging base —by flat endless belt.

Reversible Wringer—shaft driven—adjustable to all required positions for use in connection with two washtubs. Frame—exta heavy—all metal, mounted on casters with 4 adjustable lifting levers.

Tub—solid copper—detachable cover.

Wringer—Rock Maple Frame—extra quality white rubber rolls—all cog wheels enclosed. Equipped with safety release attachment.

Fast moving parts of driving mechanism fully enclosed running in oil.

Motor—Highest Standard of Quality—Special Design ¼ Horse Power.

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Toronto, London, Montreal, St. John, Winnipeg, Edmonton, Vancouver, London, Eng.

Power Plant Politics in Digby, Nova Scotia

Digby, Nova Scotia, is at present supplied with electric power by a steam plant. There is an agitation going on to have it replaced by a heavy oil engine, and we print below a report of an inspection trip made by several Digbyians to the neighboring town of Parrsboro. It is evident that this gentleman is not afraid of saying what he thinks:

To the Ratepayers of the Town of Digby

Ladies and Gentlemen:—

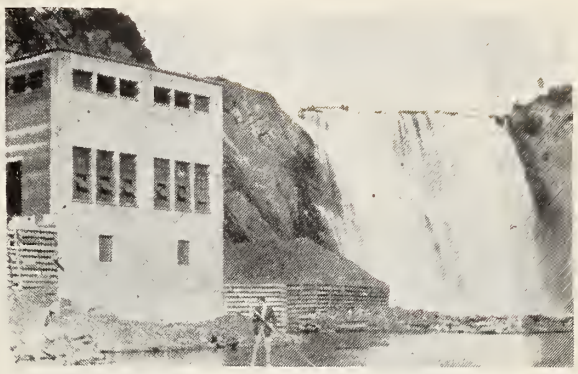
Having been invited to inspect the installation of an oil burning outfit at Parrsboro I think it is only just that my impression of this very excellent job be given a little publicity. In the year 1922 the town of Parrsboro found themselves up against the real live and progressive problem of cheaper production of electricity. They had a so called 75 h.p. steam engine driving a 40 kw. generator and were going behind at the rate of $3,000.00 per year.

A Colossal Mistake

After considerable investigation they installed a 100 h.p. semi crude oil engine, driving directly a 60 kw. generator. They are now taking care of the overhead and sinking fund of the old plant and of the new also and still have a little surplus. They, in order to do this had to leave the rate for current at 16½ cents per kilowatt less 10 per cent. but in time will have very cheap current. The colossal mistake that Parrsboro made was in purchasing all their power in one unit as they have to operate at a loss on light loads and this fact confines their running hours to the most money making periods. Most of the time they are now only carrying half a load and in that respect are like ourselves with our steam plant although our problem all round is much worse.

Had they purchased a 75 and 50 they would have been able at all times to operate at a profit, using the 75 for the regular loads, and 75 and 50 for the peak summer load and the 50 for the early morning and day loads. It is quite true that the first cost of the two would be more than the cost of one big unit but the operating, which is the part that counts, would soon offset this first cost. Their cost for fuel and lubricating oil is on an average $6.00 for 9 hours. Compare that with our $18.00 or $19.00.

One of the greatest surprises to me was the exhaust. I expected, from what I had been told, that the racket would be terrible and when I did not hear it, asked if they had the exhaust in the stack. No, they said, it was out in the open air and say folks it didn't make as much noise as our old steam wagon.



The power house of the Lower St. Lawrence Power Co., at Grand Metis Falls. This photograph is the first published showing the completed powerhouse, and is furnished exclusively to Electrical News. A further description of this interesting plant will be given in a future issue

Mud Slung Before

Now before I sat down to write this I dug out my rubber boots and slicker as the last time of writing on the town's electricity problems I received considerable mud, but would like to tell you right here that the party or parties who have said and will say that a rake off is coming to me from an oil engine deal for the town of Digby, lied and will lie.

FRITZ DAKIN.

Two 30,000 kw. turbine generator units with surface condensers and auxiliaries and the necessary transformers and switching equipment have been purchased from the Westinghouse Electric & Mfg. Company by the Duquesne Light Company of Pittsburgh as additional equipment for their Colfax Power Station.

Each unit consists of a single cylinder turbine directly connected to a 35,000 kv.a. 85% power factor generator with a 1562 kv.a., 60 cycle auxiliary house generator direct coupled to the main generator.

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are best found by reading the Constructional Activity pages of the CONTRACT RECORD AND ENGINEERING REVIEW each week. Advance information on hundreds of buildings, homes, factories, etc., in every issue gives you an opportunity of writing or calling upon men who you know to be in the market for wiring and electrical devices. Subscribe today. Only $3.00 per year. Contract Record, 349 Adelaide St. West, Toronto. 13T.f.

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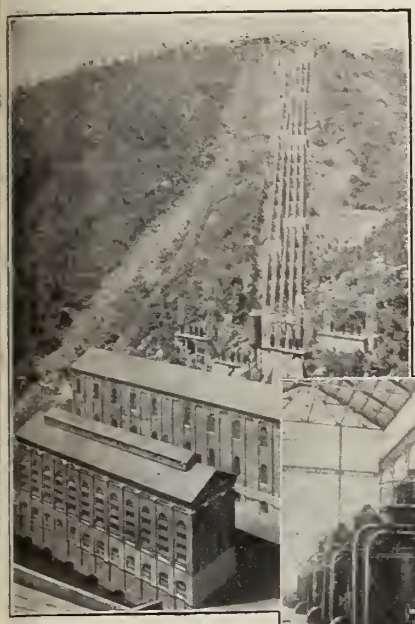
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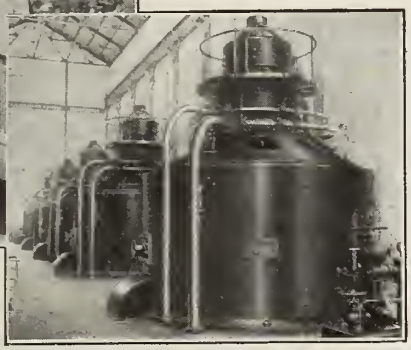
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Shown in illustration are developing 114,000 H.P. under 600 ft. head in the plant of Georgia Ry. & Pr. Co., Tallulah Falls, Ga.

These turbines have established a most remarkable record for economical and continuous service.



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A black varnish with properties similar to "Armacell."

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Also several 25 Cy. Transformers 50-750 Kva.

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No.	H.P.	Speed	Make
2	1	1800	Westinghouse
3	2	1800	T.H.E.
1	2	1800	Westinghouse
3	5	1800	Westinghouse
1	5	1800	T.H.E.
1	50	2200	Wagner—No starter

60 cycle, 3 phase, 220 volt, Second Hand Motors

1	1	1800	T.H.E.
1	2	1800	C.G.E.
1	2	600	C.G.E.
1	2	1800	Chapman Walker
1	7½	1200	T.H.E.
1	8	1800	T.H.E.
1	15	1800	Crocker Wheeler with Starter complete

25 cycle, 3 phase, 550 volt

1	2	710	Century (new)
1	3	1500	T.H.E. (new)
1	7½	750	T.H.E.
1	10	1400	Imp. Electric with Starter complete.
1	40	710	Westinghouse CCL " " "
6	30	750	Crocker Wheeler " " "
1	15	1450	Westinghouse (new) " " "
1	50	720	Westinghouse H.S. " " "
2	50	750	Crocker Wheeler AQ " " "
3	20	750	Crocker Wheeler " " "

25 cycle, 3 phase, 220 volt, Second hand Motors

1	30	720	Westinghouse without starter
1	35	750	T.H.E. with starter complete
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When an overload occurs in a circuit protected by a U-RE-LITE, it merely trips open the switch members of the U-RE-LITE. To restore service, you simply grasp the handle projecting from the front of the box and—

FIRST TO THE LEFT,
THEN TO THE RIGHT,
TURN THE HANDLE
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Built for Pole Line Use

There is an Oshkosh Pole Line Construction Tool exactly suited to your use. You will find the balance is right—your men will like the way it handles. Edges that are sharp and stay sharp are assured by use of finest tool steel—handles are made of woods carefully selected for the specific use to which the tool is subjected. Specify Oshkosh and make certain of a tool designed for pole line use.

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Tallman Lighting Fixtures

Tallman Fixtures are more and more being recognized as a Quality Line. Fixtures that are well made from heavy weight metal, with lasting finishes. That you don't need to apologize for when offering your customer.

Not cheap, but economical.

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For every season, for every home. You can order a sample Portable and test its sales power. Put it on display. Its beauty attracts attention that goes a far way to making customers.

The many (91) handsome designs and the hand-decorated shades make it easy to sell to the people who demand something different and unusual.

THIS latest line of Consolidated Portables will prove a year-round business getter. Order your sample Portable today—keep tab on the new business of your town.

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Benjamin Electric Manufacturing Co.
Canadian General Electric Company
Edmunds, J. H. & Co., Ltd.
Joyner, Co. Ltd., Winter
Northern Electric Company
Powerlite Devices Ltd.

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National Metal Molding Co.

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Canadian Drill & Electric Box Company
Canadian Westinghouse Company
Devoe Electric Switch Company
Ferguson, Pailin Ltd.
Electrical Maintenance & Repairs Company
G. & W. Electric Specialty Company
Moloney Electric Co., of Canada

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Canadian General Electric Company
Canadian Westinghouse Company
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Ferranti Meter & Transformer Mfg. Co.

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Canadian General Electric Company
Canadian Westinghouse Company
Equator Mfg. Co.
National Electric Heating Company
Renfrew Electric Products

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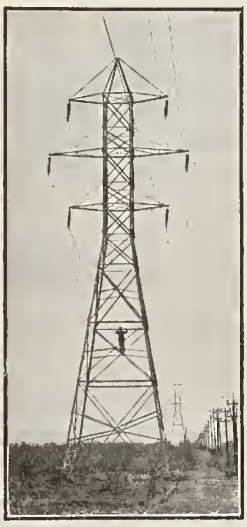
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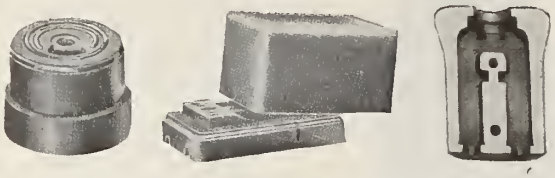
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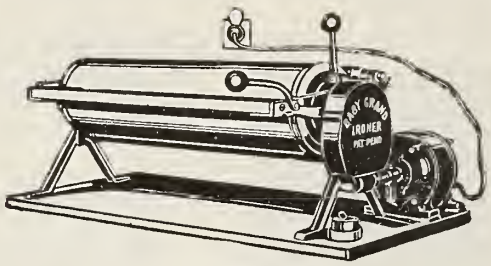
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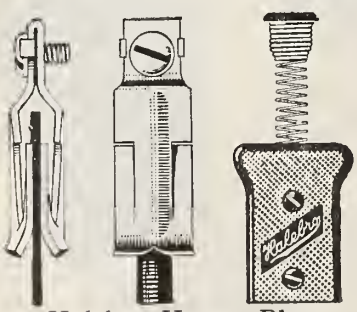
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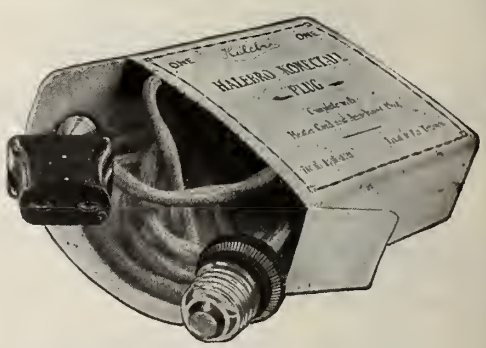
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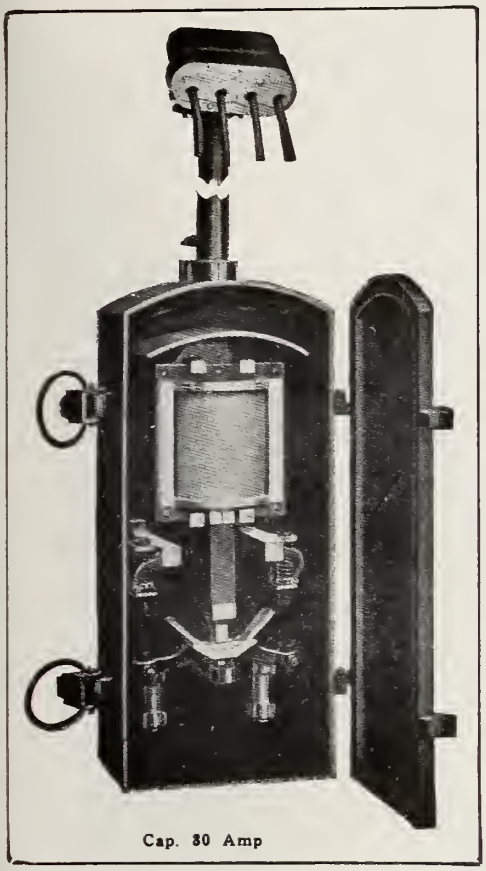
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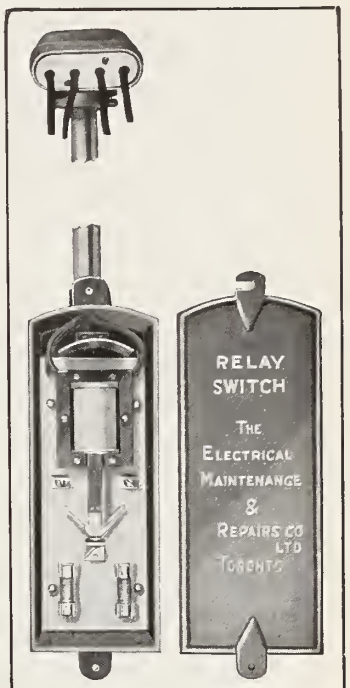
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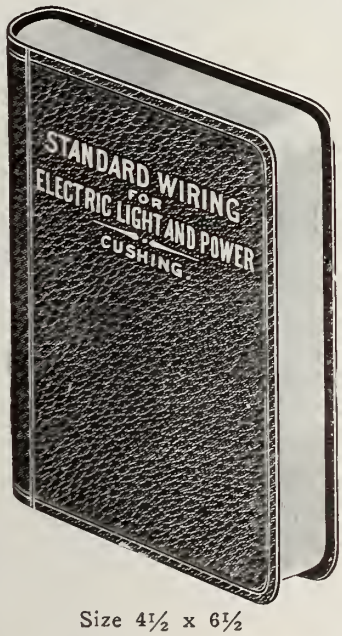
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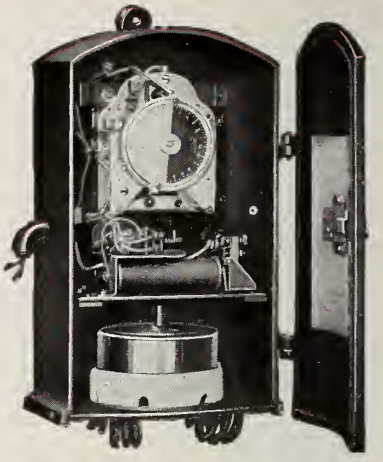
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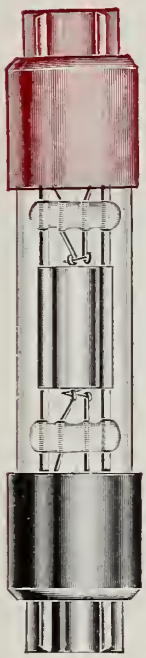
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MONTREAL TORONTO

Vol. XXXII No. 19 Toronto, October, 1, 1923

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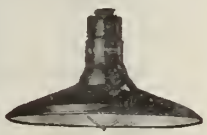
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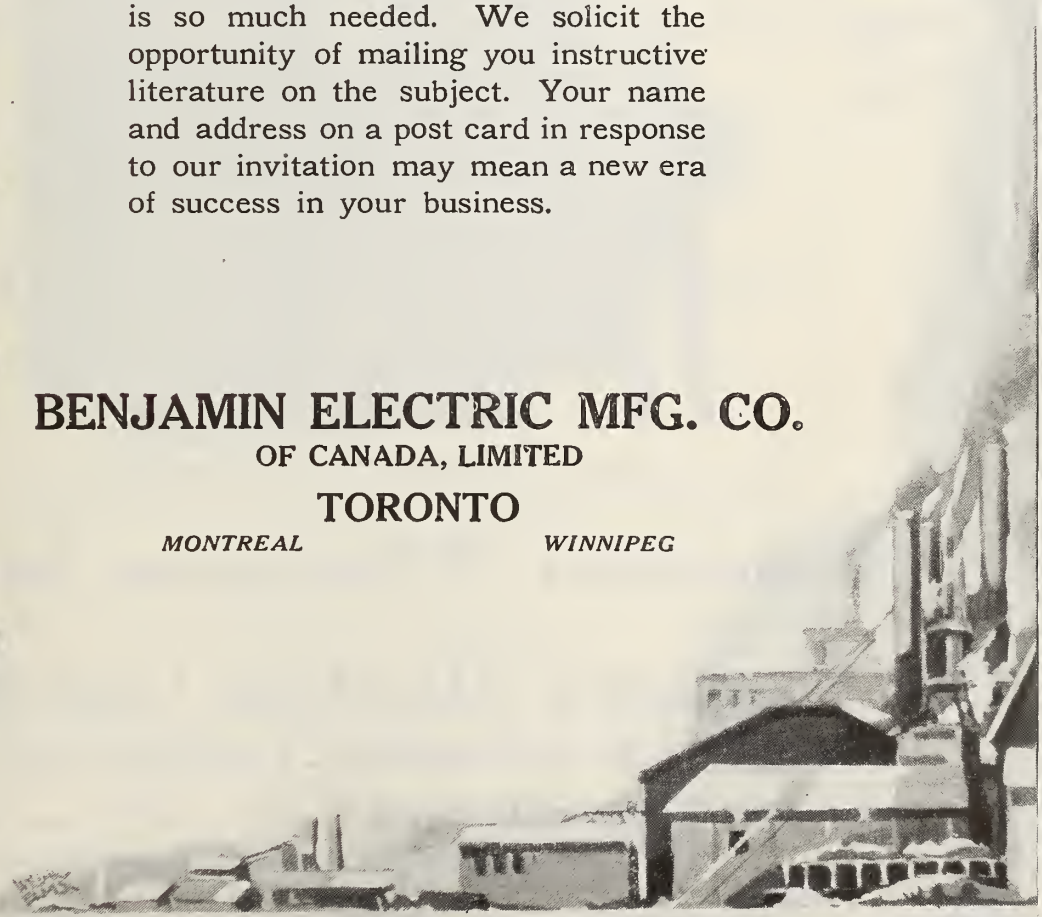
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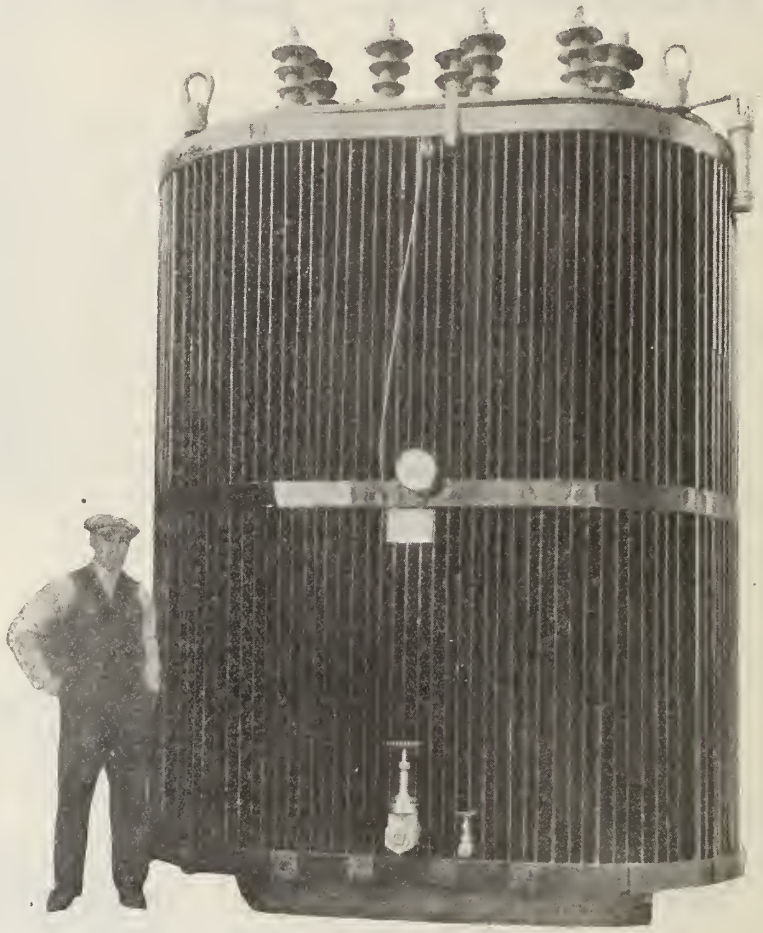


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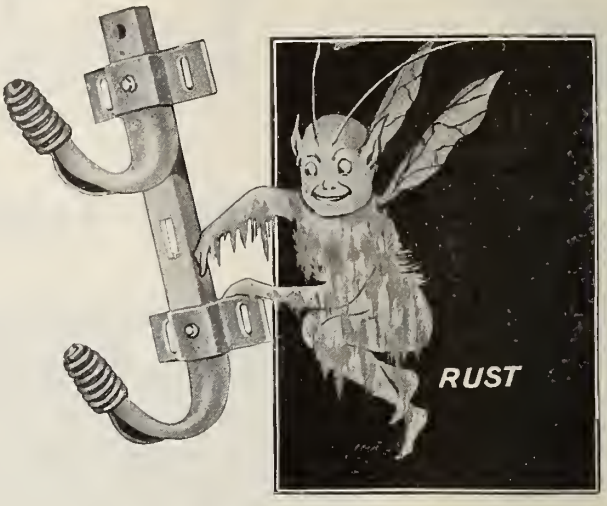
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—But the Hot-dip Galvanizing on

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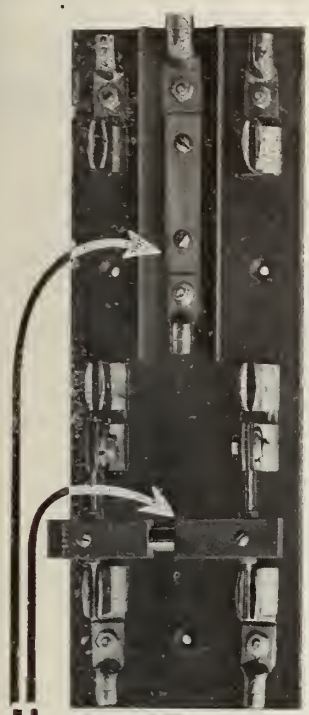
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The channel fibre encloses middle bus bar and prevents arcing and creeping.

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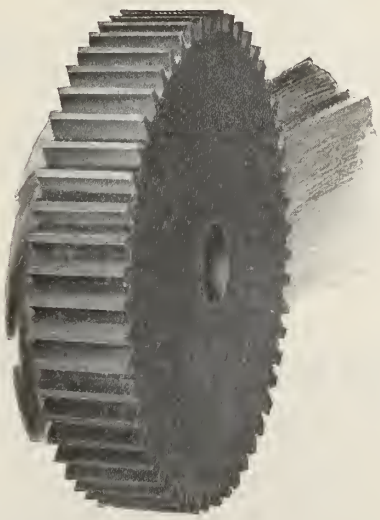
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Diamond State Fibre Company of Canada Ltd.

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Our Cased-Glass has been adopted by the Toronto Board of Education

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1060	12″	7″	6″	1/2 doz.	70 lbs.
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Strike While the Iron is Hot

OUR National Newspaper Advertising has commenced. Daily papers with a combined circulation in excess of 1,400,000, carry the message that Edison Mazda Lamps are the best lamps for every lighting purpose.

Every Home in Your Neighborhood Needs
EDISON MAZDA LAMPS

PEOPLE are moving into new homes — they'll need lamps. Children are back at school and have "home work" to do at night — they'll need lamps. Daylight saving is over and many homes have to be lighted an hour sooner — they'll need lamps. The busy season for local merchants is starting — they need lamps.

Tell people — by mail, displays, newspapers, personal calls that you have Edison Mazda Lamps for sale.

"Get them in for lamps and you will sell them other things as well"

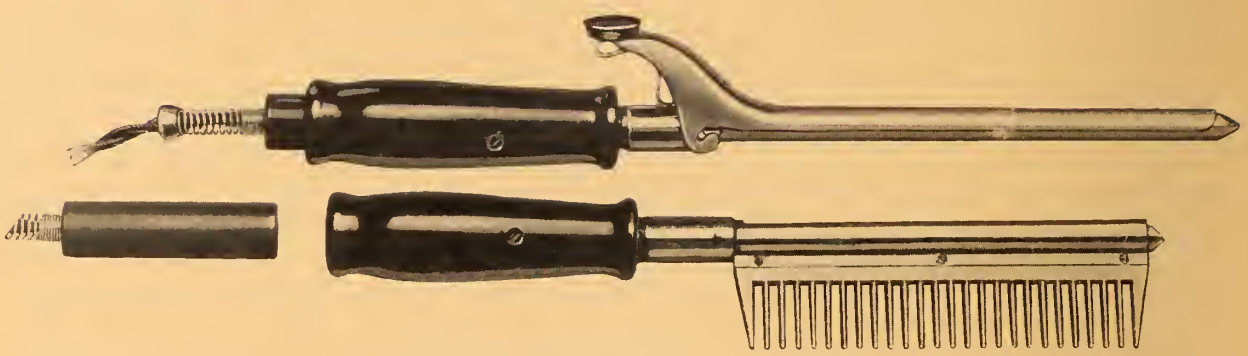
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EDISON LAMP WORKS

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Canadian General Electric Co., Limited

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Curling Iron

THIS well-nigh indispensable device, for milady's dressing table, is finished in nickel-plate with ebonized handles.

The separable swivel plug allows perfect freedom in the use of the iron, eliminating all danger of the cord becoming twisted and breaking at the terminals.

The element heats very quickly, but at no time will the waver rod become overheated. The shield is readily removable, so that the waver rod may be used alone. A comb made with aluminum teeth can also be supplied for use in drying the hair.



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HOTPOINT DIVISION

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THE STANDARD BY WHICH ALL OTHER IRONS ARE JUDGED



THE Hotpoint Iron maintains its enviable position, simply and solely through its quality. It is built up to a standard not down to a price.

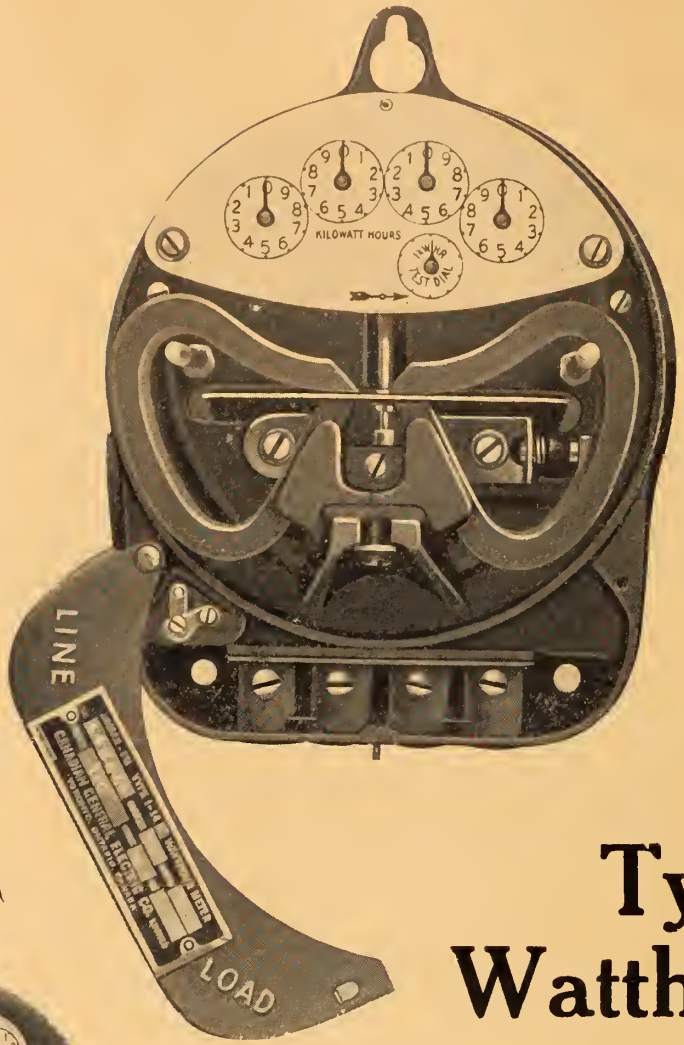
As a rule, the first electrical appliance a woman buys is an iron. It is, therefore, essential that she secure complete satisfaction, in order that the road may be paved for further sales. To create prestige for your store, sell your customers the famous Hotpoint Iron.

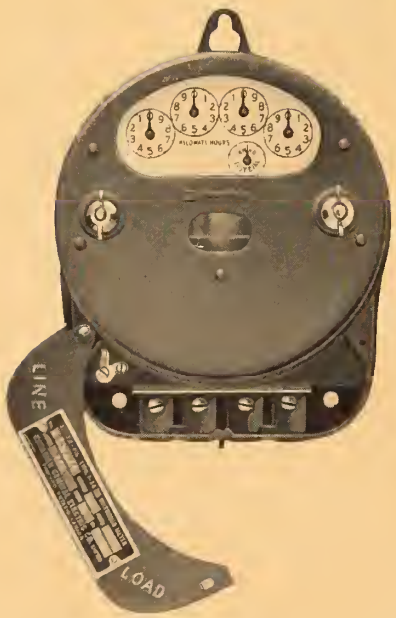
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of

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Type I-14 Watthour Meters

THE I-14 Watthour Meter increases in popularity year after year. All parts are easily accessible and can be removed for inspection without trouble. Examination of parts does not disturb any adjustment, and if for any reason the meter is disassembled, it may be put back with the assurance that the relative position of the various elements is the same as when originally assembled.

The register is elliptical in shape and of the four dial type equipped with a test pointer. Enamelled dial face with legible numerals and permanent pointer, makes reading easy. The gears and pinions are subject to rigid inspection for roughness and bad alignment before being used.

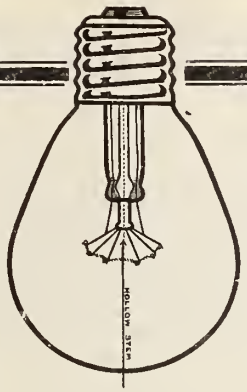
The unit type insulation makes it possible to renew the insulation or terminals without the necessity of returning the meter to the factory.

"Made in Canada" by

Canadian General Electric Co., Limited

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THE development of DALYTE "HOLO-STEM" TIPLESS lamps marks the greatest advance in the art of incandescent lamp manufacture since tungsten alloy metal filaments were produced. But what is probably even more interesting to the dealer is their complete acceptance by the public and the remarkable sale they are enjoying.

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A card will bring you full particulars at no obligation whatever. Do it now.

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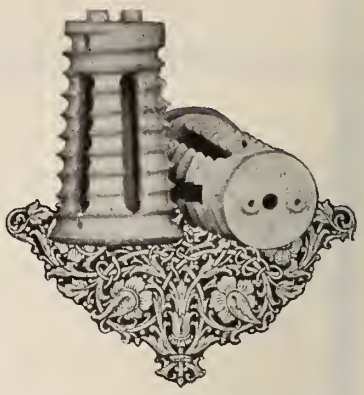
Guelph, Ont., Canada

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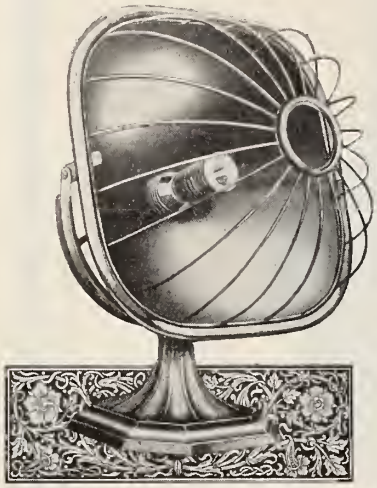
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L&H REFLECTOR HEATERS use ELEMITE



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Write for samples for testing

THE LOUTHAN MANUFACTURING CO.
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Moloney Transformers

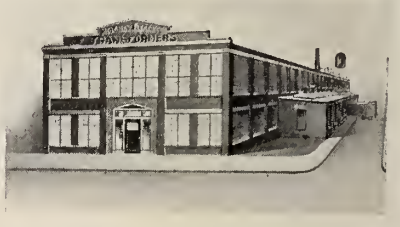


Distinguished for their superior performance, economy and reliability

Designed for greater efficiency, and constructed of the finest materials by experts in their line, Moloney Transformers are acknowledged leaders. Moreover they are entirely Canadian built.

We can make prompt delivery on Service Type Transformers from stock.

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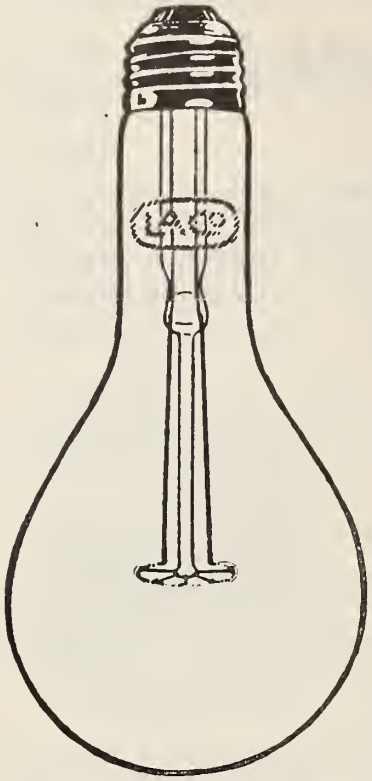
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LACO LAMPS

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OFFICES AND SHOWROOMS:
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CHEAPER CLEANER SAFER THAN GAS

Sepco AUTOMATIC ELECTRIC

CHEAPER CLEANER SAFER THAN GAS

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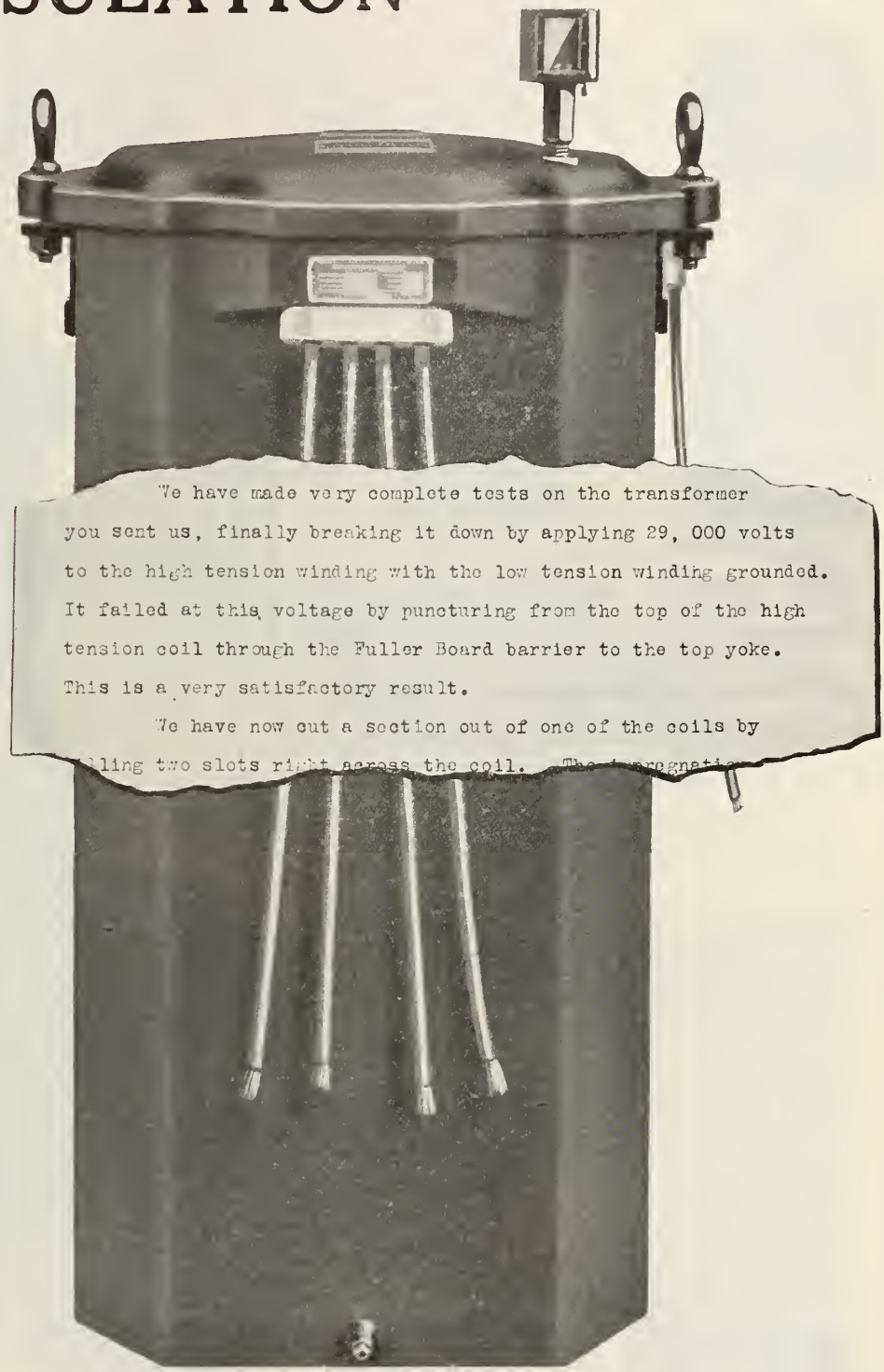
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It failed at 29,000 volts.



But even at 29,000 volts on a 2,200 volt lighting transformer, it didn't fail between primary and secondary.

If you can buy better transformers, by all means buy them.

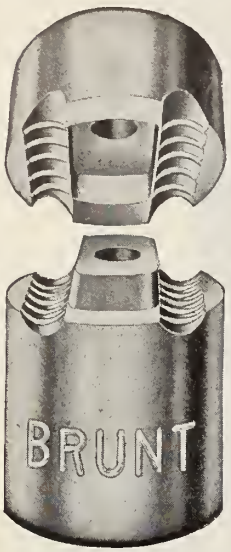


We have made very complete tests on the transformer you sent us, finally breaking it down by applying 29, 000 volts to the high tension winding with the low tension winding grounded. It failed at this voltage by puncturing from the top of the high tension coil through the Fuller Board barrier to the top yoke. This is a very satisfactory result.

We have now cut a section out of one of the coils by ...lling two slots right across the coil. The impregnation...

FERRANTI METER AND TRANSFORMER
MANUFACTURING COMPANY LIMITED
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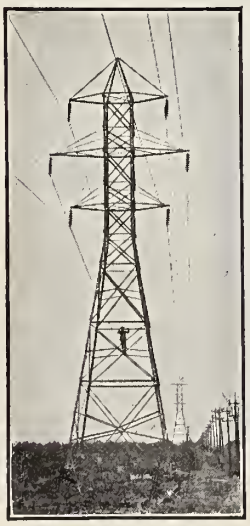
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Standard Tower Hydro
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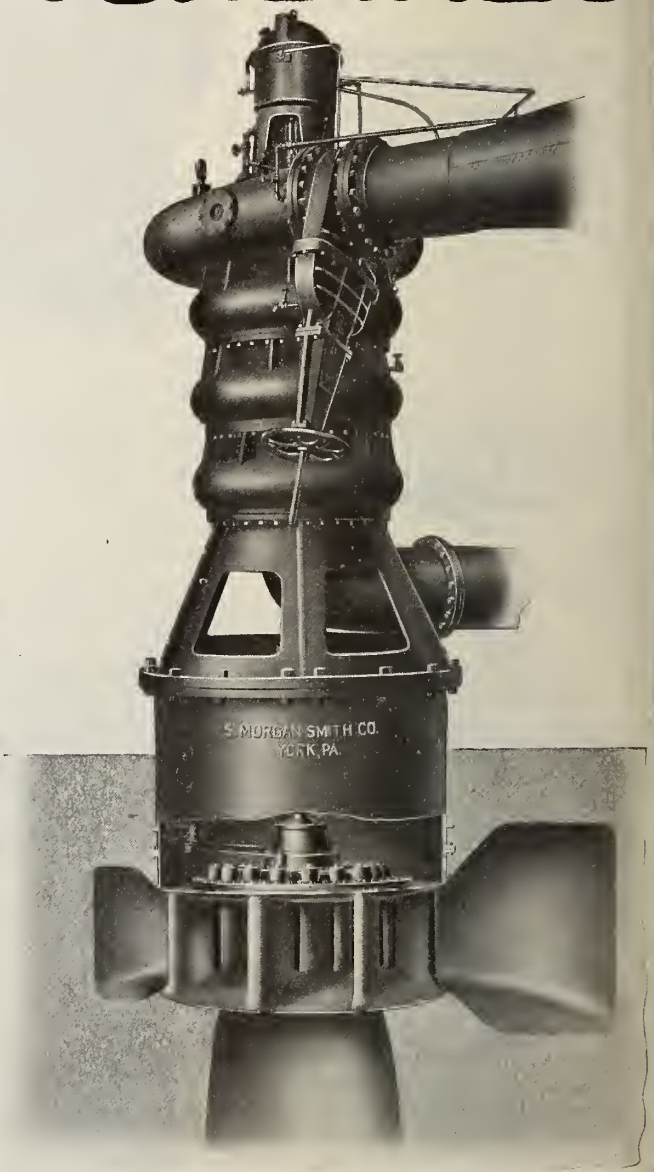
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Bulletin "N" shows many uses to which Smith Turbines may be adapted.

S. MORGAN SMITH CO., York, Pa.
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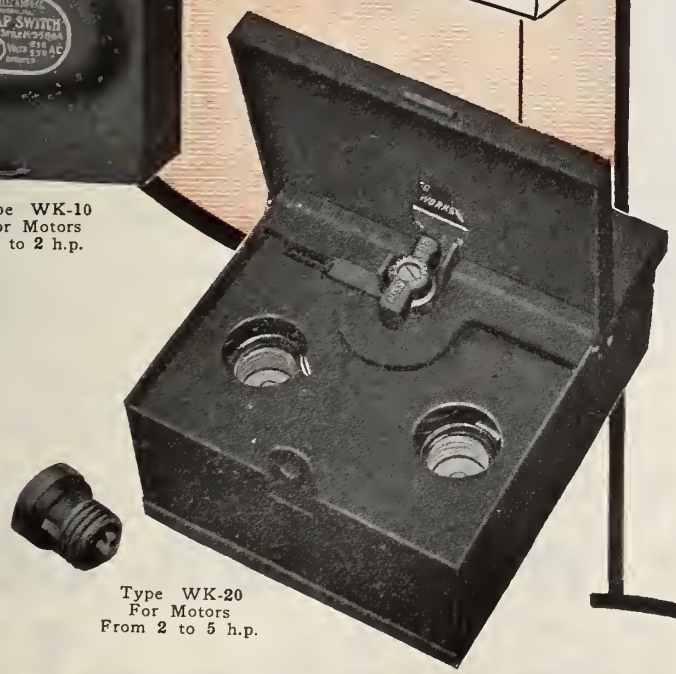
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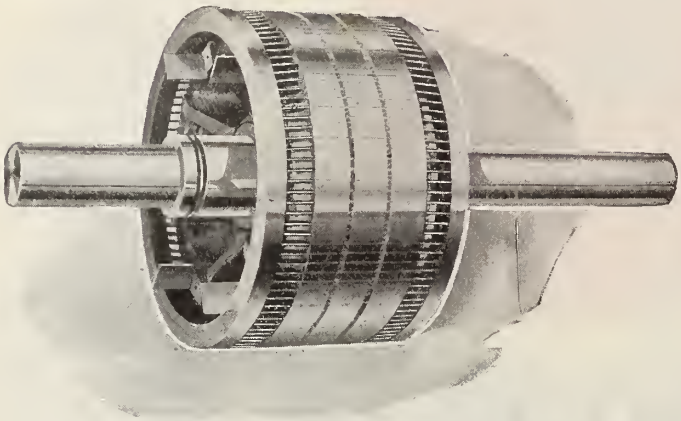
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Let us tell you how and where to look for this extra profit! Write—

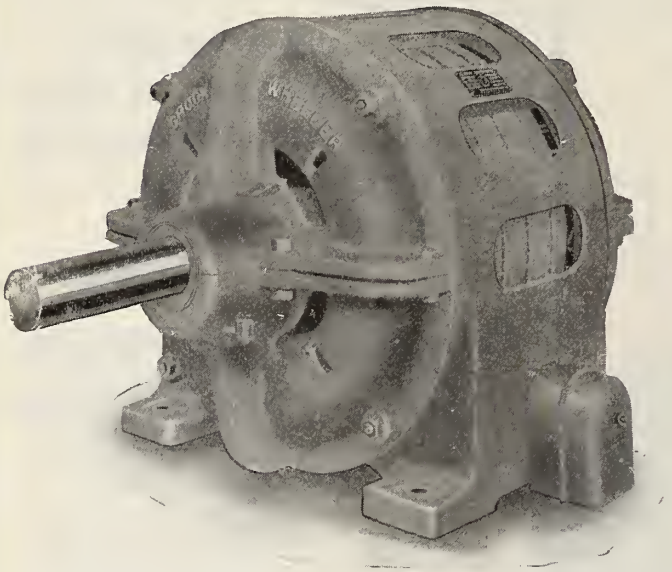
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Canadian Crocker-Wheeler cast welded squirrel cage Rotor —an exclusive Crocker-Wheeler feature



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Look to the opinion of an unprejudiced "electrical friend" of yours.

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Reliable Radio "A" Battery For Peanut Tube Sets

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3. **Better construction.**

"Insist on the Battery with the Blue Label."

Write to-day for our special Introductory offer on Reliable Radio "A" Batteries.

Superior Construction is a proven feature of all "Reliable" Batteries. Here's proof.

Department of the Interior
DOMINION OBSERVATORY

OTTAWA, CANADA. June 16th, 1923

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Dear Sir,

It might interest you to know that in the several years we have been using your batteries in wireless work we have found them eminently satisfactory. We have made special tests and have found them to stand up as well as, and in nearly every case very greatly better than any other make. We used them in our own party down the Mackenzie River during the past two summers, last summer and this summer many parties from different branches are using them. Particularly useful were the specially waterproofed variety. It is almost impossible to keep all dampness from equipment at times. One wireless set got two complete duckings on the way in last year.

On our shelves I see Reliable B batteries that have been to the mouth of the Mackenzie River and back and are still good. A few were left in the country and no doubt are still there being used on a small receiving set that a party of the Topographical Survey kept there. Another I see here is dated as received in Nov. '21 -- probably was also out in use in the field -- and is still in service at the Observatory here. I was informed one set of four of your regular #6 dry cells lasted practically the whole season supplying the filament of a V24 valve set used for receiving time signals twice daily on Great Slave Lake -- this valve takes about .75 amps, much more than one of the newer Peanut variety that we are now using for the field which require only about .25 amps.

Trusting the above may be of some interest to you,

Very sincerely,

J. P. Henderson

J. P. HENDERSON,
DOMINION OBSERVATORY
OTTAWA.



The Dominion Battery Co. Limited, Mill and Trinity Sts., Toronto

Do You Realize

that day after day switchboard instruments continually indicate the current and potential of a circuit and require careful construction to withstand this service and remain accurate?

NORTON

Ammeters and Voltmeters are of the

Highest Accuracy
and
Unequalled Durability

They are the result of years devoted to scientific construction by skilled men, who have made instrument building their life's effort.

Write for latest booklet.

Norton Electrical Instrument Co.
61 Hilliard St. **Manchester, Conn., U.S.A.**

(*Builders of ammeters and voltmeters for over a quarter of a century*)

PUBLISHING HOUSE of HUGH C. MACLEAN

This Mark Stands for Prestige, Power and Consistent Performance in Business Publishing.

It is the Guarantee of Interest for the Reader and a Wealth of Purchasing Power for the Advertiser.

Hugh C. MacLean Publications
LIMITED
349 West Adelaide Street - - Toronto

QUALITY RADIO SUPPLIES

We stock only the most reputable lines such as:

Frost	Atwater Kent Co.	Homecharger
Brown	Howard Radio Co.	Valley Charger
Pacent	Hart "A" Batteries	Northern Elec. Co.
U. S. Tool	Burgess Batteries	Westinghouse Sets
Murdock	Eveready Batteries	Marconi Wireless Co.
Magnavox	Condensite Celoron	Can. Indept. Tel. Co.

Write for price list *Discount Sheet to Dealers*

TORONTO RADIO COMPANY
62 Yonge St. Arcade **Toronto, Ont.**

INFORMATION

JUST PUBLISHED OUR NEW
ALUMINIUM HANDBOOK
WRITE FOR A COPY NOW

THE
BRITISH ALUMINIUM CO. LIMITED
592 KING ST. W. TORONTO

KLITZEN

REGENERATIVE—

Receiving Sets

Real Radio Simplicity

Only one adjustment

Licensed under Armstrong Patents

The principal feature of No. 525 Regenerative Tuner Detector, 2-stage audio amplifier is SIMPLICITY.

Any operator can get wonderful results because there is only one adjustment. Receiving Range practically the same as that of the best radiophone equipment on the market.

Each unit carefully tested before shipment. The best material and most highly skilled workmanship employed—it is the product of experts who have been making radio equipment since 1913.

JOBBERS AND DISTRIBUTORS. Write for full information and big discounts. DEALERS—ask your jobber or write us.

KLITZEN RADIO MFG. CO., Inc.
Racine, Wis.



MODEL No. 525 LIST PRICE **$80.00**

It's Not Price—But Satisfied Customers that Build Businesses



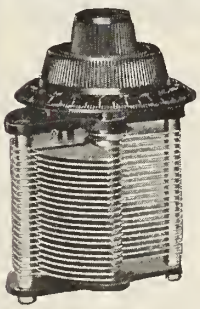
It's a poor business policy for anybody to say "Bother quality—what I want is low price." No matter what you buy you get just what you pay for.

United Radio Products are not built to meet a price but to meet the requirements of the Radio buyers.

The products are mechanically and electrically right and after three years we know that they have made friends wherever they have been sold.

We believe every dealer who is looking ahead will agree with the wisdom of our policy and we are ready to back him up by our full guarantee.

United Audio Frequency Amplifying Transformers are an attractive piece of merchandise—bringing in results—and satisfaction. List $4.50.



United Condensers have been accepted as standard and are selling in increasing quantities.

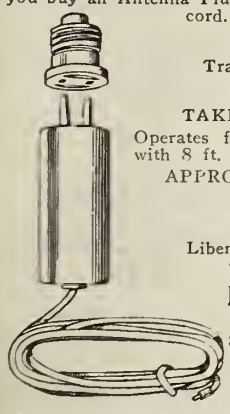
LIST PRICES

Plain	43 plate	$4.50
"	23 "	4.00
"	11 "	3.50
"	5 "	2.75
"	3 "	2.25
With Vernier Dial and Knob		
	46 plate	$6.50
	26 "	5.50

Jobbers: Send for Discounts

UNITED MFG. & DISTRIBUTING CO.
9705 Cottage Grove Avenue **Chicago, Illinois**
New York Office: 50 Church St., New York, N. Y.
San Francisco Office: 709 Mission St., San Francisco, Calif.

You wouldn't buy an automobile without a self starter. When you buy an Antenna Plug insist on one complete with a handsome cord. Buy the original.



Trade "NO AERIAL RAD-O-PLUG" Mark

TAKES THE PLACE OF AN AERIAL

Operates from any electric light socket. Complete with 8 ft. cord.

APPROVED BY NATIONAL BOARD OF FIRE UNDERWRITERS

PRICE $2.50

Liberal discounts to jobbers and dealers
Write for circulars Agencies Open

Radio Products Corporation
Manufacturers Distributors
8926 Clarendon Ave., Detroit, Mich.

Representative for Western Canada:
F. E. Garrett & Co., 607 Union Trust Bldg.
Winnipeg, Man.

MICA

Reliable Mica Insulation
OF EVERY DESCRIPTION

Commutator Plate Motor Ring
Moulding & Flexible Plate Tubes
Raw Mica [cut and uncut] Ground Mica

MICA COMPANY OF CANADA Ltd.
HULL, Quebec

CANADIAN PRODUCTS

ARMOURED CONDUCTORS

TWIN AND THREE-CONDUCTOR
IN SIZES, NO. 14, 12, 10, 8 AND 6

FLEXIBLE STEEL CONDUIT

3/8", 1/2", and 3/4"

Look for the identification mark (L N) stamped every two and a half inches on all our steel products.

NON-METALLIC FLEXIBLE CONDUIT

TRADE MARK
Loomduct
REGISTERED

A single wall Conduit of unusual flexibility

SIZES

1/4", 3/8"
1/2", 5/8"
3/4" & 1"

TRADE MARK
Insuladuct
REGISTERED

A double wall Conduit that has stood the test of time

FIBRE TWINES AND CORDAGE

Made from the highest grade Kraft and suitable for the manufacturing of all products in which paper is used

TORONTO
Robert G. Ross
701 Eastern Ave.
Telephone
Gerrard 467

The L. & N. Co. Limited
ST. JOHNS, QUE.

WINNIPEG
Fred E. Garrett & Co.
607 Union Trust Building

Six Seventy-Five

a low price for loads of heat



Model "D"

$6.75

West of Ontario *$7.00*

H. E. P. C. Approval No 853

17½ Inches High

AT last the householder may procure a real electric heater at a very small investment.

The low price—$6.75—doesn't mean that this is a cheap, competitive specialty. Rather model "D" STAR-RITE Electric Heater is made by an organization equipped to produce this device in quantities sufficient to warrant a low selling price, but in a quality worthy of backing with a worthwhile guarantee.

For instance—note the new idea in our artistic andiron base! Then the 12-inch, pure copper reflector, octagon in shape. Its height is just right —17½ inches. The heating element is nickel-chromium and removable by screwing out.

And the demand?—it is created and kept growing by consistent advertising. Link up this demand with the low selling price and you have the makings of real profitable business.

BUT—place your orders with specified delivery date NOW—with your jobber. He'll keep his word on deliveries, too.

from your jobber

THE CANADIAN FITZGERALD MFG. CO.

95 KING STREET EAST TORONTO, ONT.

Star-Rite Heaters

Guaranteed

NO MORE CHILLS

No More Cold Corners

WAFFLE IRONS TOASTERS HEATING PADS VIBRATORS VIOLET RAYS SEWING MOTORS

Standard Radio Equipment

(De Forest Patents)

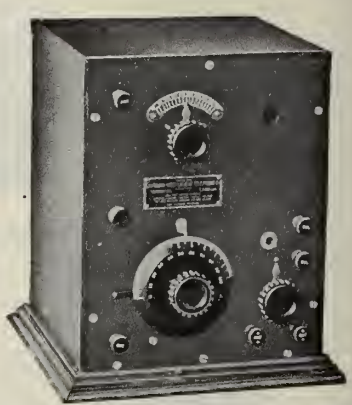
Improved Receiving Sets

Let us tell you about them and how you can cash in on this Season's business.



Universal Receiver

Better Sets at Lower Prices



SC 10. Receiver

Our MADE-IN-CANADA Audio and Radio Frequency Transformers, Head Sets, Plugs, Jacks, Variable Condensers with Vernier Attachment, and other Radio Parts are in great demand because the quality is right and also our prices.

Write to-day

Canadian Independent Telephone Co., Limited

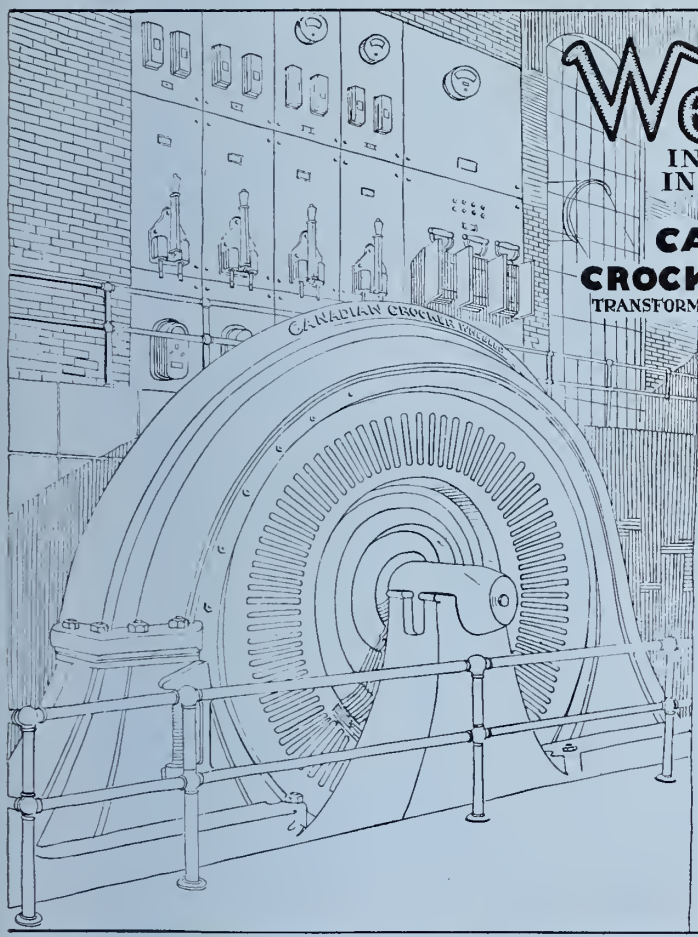
Toronto, Canada

Manufacturers of Telephone and Radio Equipment

Radio Corporation of Winnipeg, Limited, Winnipeg, Man.
Radio Corporation of Vancouver, Limited, Vancouver, B.C.
Radio Corporation of Calgary, Limited, Calgary Alta
Radio Corporation of Regina, Limited, Regina, Sask.

POWER APPARATUS

OF ESTABLISHED REPUTATION AND DEPENDABILITY



Weston
INDICATING INSTRUMENTS

ESTERLINE
GRAPHIC INSTRUMENTS

CANADIAN CROCKER-WHEELER
TRANSFORMERS & ELECTRICAL MACHINERY

ONDIT
OIL SWITCHES & CIRCUIT BREAKERS

SANGAMO
INTEGRATING INSTRUMENTS

C-H
CONTROL APPARATUS & HEATING EQUIPMENT

Wagner
SINGLE PHASE MOTORS

ELECTRICAL ENGINEERS EQUIPMENT Co. THREE CHICAGO U.S.A.
SWITCH BOARD & PROTECTIVE FITTINGS

Northern Electric Company
LIMITED

MONTREAL	TORONTO	WINDSOR	CALGARY
HALIFAX	HAMILTON	WINNIPEG	EDMONTON
QUEBEC	LONDON	REGINA	VANCOUVER

"Makers of the Nation's Telephones"

MANUFACTURING
Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and receiving Equipment

DISTRIBUTING
Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

ELECTRICAL CONDUCTORS
TELEPHONE TELEGRAPH AND POWER CABLES



Paper Insulated Sector L.C. Power Cable

Submarine Telephone Cable

Varnished Fabric Taped and Braided Power Cable

Paper Insulated Armored Power Cable

Paper Insulated L. C. Telephone Cable

Types of Electrical Conductors made in our Montreal Factory where we are staffed and equipped to manufacture Wires and Cables for every electrical need.

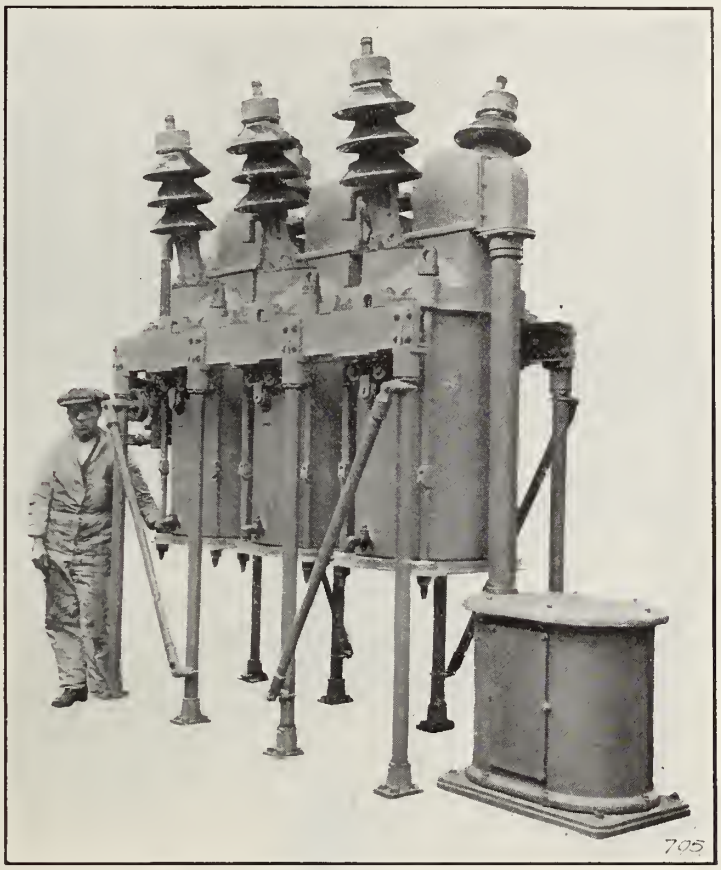
Northern Electric Company
LIMITED

MONTREAL TORONTO WINDSOR CALGARY
HALIFAX HAMILTON WINNIPEG EDMONTON
QUEBEC LONDON REGINA VANCOUVER

"Makers of the Nation's Telephones"

MANUFACTURING
Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and receiving Equipment

DISTRIBUTING
Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings



26,400 Volt Outdoor Oil Circuit Breaker

If you require equipment of a **robust** and **reliable** design and first class workmanship, enquiries forwarded to

FERGUSON, PAILIN LTD.

Canadian Office and Warehouse:

321 KING STREET EAST, TORONTO, ONT.

will receive prompt attention. Equipment ordered will be to your satisfaction.

Polar Cub
Electric Heater
Retails $7.50

Approved by Ontario Hydro Electric Commission



Nearly every feature of our new Heater has been improved and it represents the best value offered on any market.

Specifications

Solid copper reflector 11″ diameter, beautifully burnished, adjustable reflector—wire guard and filament easily detachable. Screw in filament equal to the best. 600 Watts 110 A.C. or D.C. Equipped 7 feet No. 16 Heavy Heater cord and two piece separable plug. Complete window display material with every dozen Heaters.

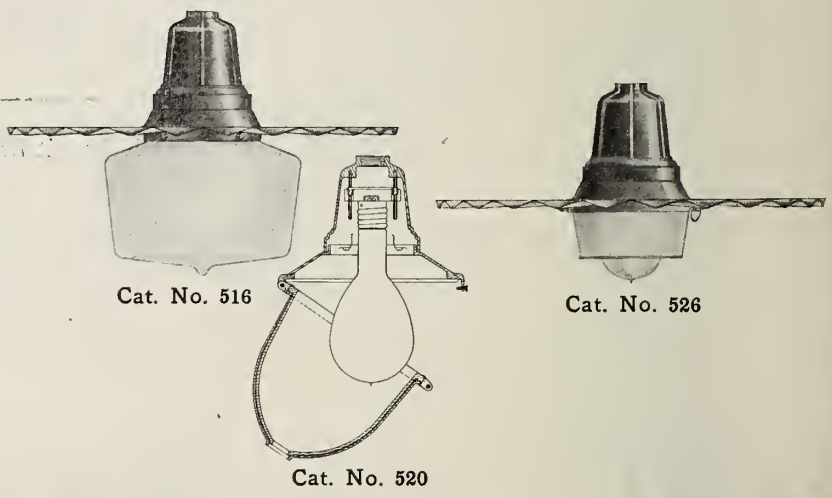
ORDER NOW PLEASE

The A. C. Gilbert Menzies Company, Limited

439 King St. W. **TORONTO**

Polar Cub Fans — Hair Dryers — Vibrators — Sewing Machine Motors — Radio

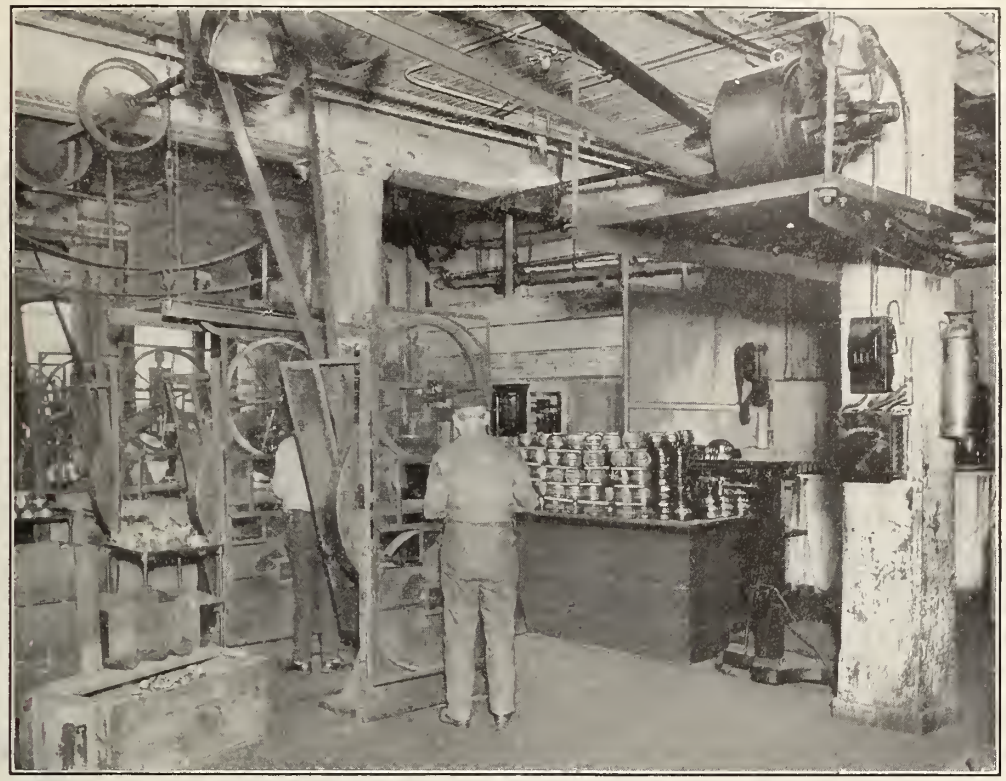
A group of Multiple Fixtures containing complete interchangeable parts. May be equipped with Mogul or Medium base — adjustable or rigid sockets. Takes any 6 or 8″ globe or Holophane refractor.



56 Different Fixtures of this type

Winter Joyner Company Ltd.

455 King St. West **Toronto**



18 YEARS OF SERVICE and STILL GOING STRONG—

That is the record of nine 12½ H.P. direct current R & M Motors employed in the plant of the U.S. Metallic Packing Company, Philadelphia, makers of metal packings for all types of steam lines.

The motor illustrated drives a group of band saws. Other R & M Motors power boring and facing machines.

Whatever their duties, however, these motors have been doing their work faithfully for eighteen years— with a minimum of repair expense and no costly breakdowns.

The service rendered U. S. Metallic Packing Company by their R & M Motors is but common experience with all having such installations.

Profits free from service expense are the kind that make a dealers' bank account grow without set backs.

You make that kind of profit when you sell R & M Motors. Get all the details from us or our nearest distributor.

There are R&M Motors up to 150 H.P. in size for all motor needs.

THE ROBBINS & MYERS COMPANY OF CANADA, LIMITED

Brantford - Ontario

Representatives;

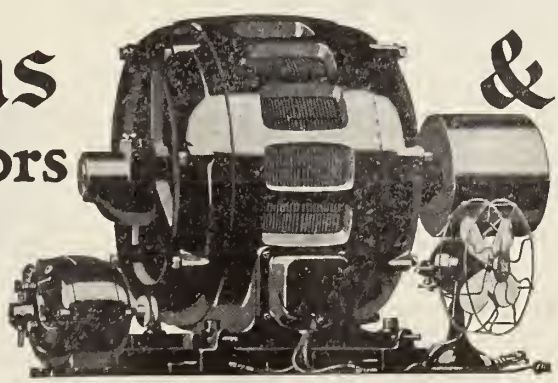
Montreal
E. W. Playford,
358 Beaver Hall Sq.

Winnipeg
Cochrane, Stephenson & Co. Ltd.,
265 Portage Ave.

Vancouver
Cochrane, Stephenson & Co. Ltd.,
901 Credit Foncier Bldg.
850 Hastings Street,

Robbins & Myers

Motors *and Fans*





Royal Dealers find the Royal is—

"Easy to Sell and Hard for others to compete against"

MONTH by month ROYAL Dealers are showing a substantial increase.

The increase over last year and previous years is enormous.

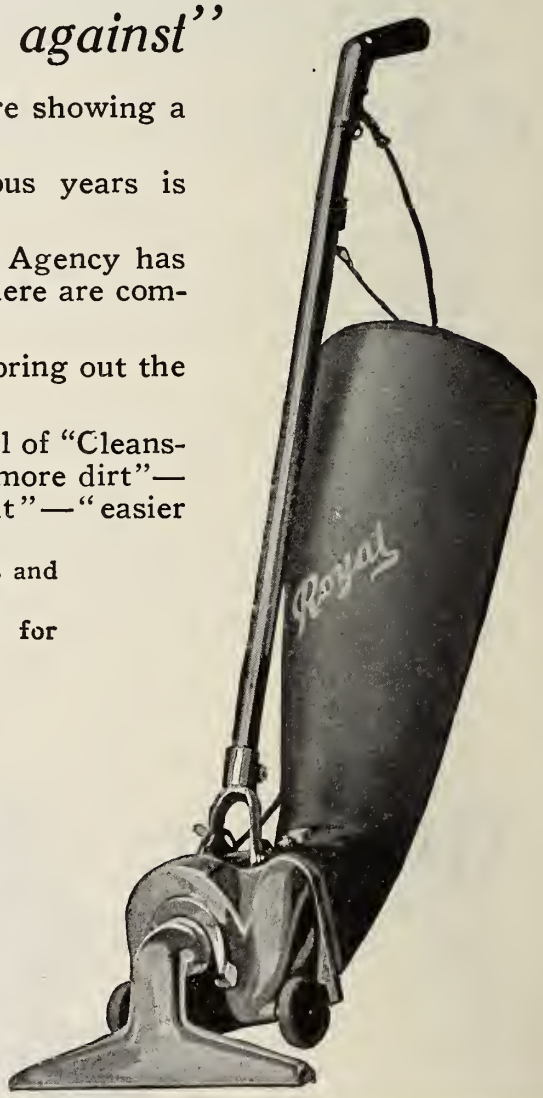
ROYAL Dealers are finding the ROYAL Agency has become mighty valuable. Women everywhere are coming over to the ROYAL.

Competitive demonstrations only serve to bring out the ROYAL'S superior advantages.

ROYAL advertising is spreading the gospel of "Cleans-by-air-alone"—of "more efficient"—"gets more dirt"—"less wear on carpets"—"lighter weight"—"easier to use."

ROYAL Dealers are doing the business and making profits.

We still have a few territories open for dealers who know how to sell.



ROYAL
QUALITY SERVICE

ELECTRIC CLEANER

Cleans by Air-Alone!

Made in Canada by
Continental Electric Co., Limited
507 King St. East, Toronto.

Electrical Engineering Contracting News Merchandising Transportation

For over thirty years the recognized journal for the Electrical Interests of Canada

Hugh C. MacLean Publications Limited

Thomas S. Young, Managing Director
W. R. Carr, Ph.D., Managing Editor

Head Office: 347 Adelaide Street West, Toronto

SUBSCRIPTIONS

The "Electrical News" will be mailed to subscribers in Canada, Great Britain and British possessions post free, for $2.00 per annum. United States $2.50. Other foreign countries $4.00. Single copies 15 cents. Remit by cheque, registered letter, or postal order payable to Hugh C. MacLean Publications Limited.

MONTREAL - 119 Board of Trade Bldg.
WINNIPEG - - 302 Travellers' Bldg.
VANCOUVER - - Winch Building
NEW YORK - - 296 Broadway
CHICAGO - 14 West Washington St.

Subscribers are requested to promptly notify the publishers of failure or delay in delivery of paper.

ADVERTISEMENTS

Orders for advertising should reach the office of publication not later than the 5th and 20th of the month.

Member Business Newspapers Association of Canada

Vol. 32 October 1, 1923 No. 19

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PUBLISHING HOUSE OF HUGH C. MACLEAN

Edwards "Bronx" Pushes

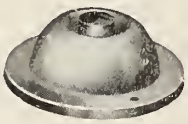
One Piece Solid Back

Each push has a black composition centre which is far superior to any metal centre.

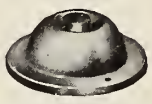
The mechanism of each "Bronx" Push is entirely insulated and is recessed sufficiently to allow the use of No. 14 wire and still have plenty of room between the screws and the wall, there being no chance of grounding.

Each push gives a positive contact and the fibre is recessed so the wire cannot slip out of place.

Each Push is packed in an individual box.



No. 600—2¼" Dia.



No. 603—1¾" Dia.



No. 604 Plate Type
3 9/16" x 1 11/16"



No. 601 Single Card-Holder 2⅜" x 2"



No. 602 Double Card-Holder 4½" x 2"

The Standard Finish is Satin Brass.

Prices on Application — ***Immediate Delivery***

1872 EDWARDS

EDWARDS and COMPANY INC.

1872 EDWARDS

602 Avenue Block
Winnipeg

3 St. Nicholas Street
Montreal

220 King St. West
Toronto

ELECTRICAL NEWS
DEVOTED TO THE INTERESTS OF
A UNIFIED ELECTRICAL INDUSTRY

"Radio Business Will be Good" Declares the Trade

Shakedown of Last Few Months Has Stabilized the Entire Radio Industry —Inferior Apparatus Fast Disappearing

Eye-opening results have been secured from a survey of the prospects for radio business this coming fall and winter, recently conducted by the Electrical News. Opinions were obtained from representative dealers and manufacturers, and the consensus of their judgment is set forth below. These men know the business and what they say makes us feel that radio is coming into its own. All are optimistic and predict that good business will follow sound merchandising. Many opinions were crowded out, but those that follow may be considered representative:

"Results Will be Obtained"

"The writer has just returned from a four weeks trip out West. During the months of July and August, radio appears to go dead but we are inclined to think that is due to lack of effort as a store in Winnipeg advertised head sets about the 26th of August and sold two hundred and eight sets from this one ad. The writer noticed that the trade in many cases, made radio windows at school opening. The response to these displays seemed to be immediate and satisfactory in every case where the dealer had a well balanced stock to offer. In our opinion, radio is just a little better than any other business at the present time but the trade are not giving the same service that they do in other lines and some of them seem to expect that the amateurs should fall into their store as soon as they put a few radio parts in their window. It is satisfactory to note that some dealers have been getting good business from rural districts during the summer months by appointing agents to sell to farmers and residents in villages. This idea could be worked up in any part of Canada."

The A. C. Gilbert-Menzies Co., Limited.

Results Will be Obtained"

"We are very optimistic about the results that will be obtained from merchandising quality radio apparatus on the same sound business principles as other electrical products are sold. We confidently feel that the day of the curb stone broker and the



"Yes, we have lots of orders today"—Dealers' Chorus

jip manufacturer is fast receding and that those who have survived the depression following the radio boom will now come into their own."

The Jack V. Elliot Co.

"General Outlook Encouraging

"The general outlook for radio business this coming Fall, from present indications is very encouraging. There seems to be a greater demand for high class apparatus. The demand for standard high class manufactured sets is increasing each week and we attribute this to the fact that the better class of business man is becoming interested in radio, and invariably wants a set installed that has been manufactured by a high class reliable radio concern who will stand behind the product."

A. Carey & Sons.

"Better Class Demand"

"The demand is going to be for the better class quality products. The day when the buyer took home any condenser or rheostat or other part is passing, if it has not already passed. Today the buyer wants products bearing the names of reputable makers. He has proven with cheap parts that his set will work. He knows that with better parts it will work better. He has learned that in radio, as in everything else, quality is worth its price. Furthermore, the manufacturers are learning too. When radio was regarded as a fad, likely to die out in a season, the maker of parts may have been justified in asking as much for poorly designed, poorly made goods as he ought to have been willing to sell meritorious parts for. With a realization that radio is here to stay, the parts-makers are pricing their products at manufacturing costs plus a fair profit and they are spending money to get correct design and proper machine-tools for economic production of built-to-last goods that will bring repeat orders."

Wright Radio Company

"Better Than Last Season"

"Radio business this fall will be very good—even better than last season. The tendency, as shown by our sales, is that the demand will be after parts although a few sets are being sold. We are particularly pleased to note that the customer is demanding quality parts and standard makes which will certainly improve the radio game. Inferior goods seem to be going off the market."

Canada Radio Stores

"Record Trade Coming"

"All indications point to a record fall and winter trade, the public have learned that it pays to buy the product of manufacturers who have built up a reputation for good material and fair values. Cheap defective material is not being sold by progressive dealers because the buying public have learned their lesson and are now asking for the best. This change is particularly noticeable in complete receiving sets and we are unable to keep up with the demand for good receivers."

C. R. Fraser & Company

"Radio Reguiar Home Equipment"

"Anyone who knows anything about the radio business will now clearly admit that radio for home entertainment and education is here to stay. In other words any publicity that is given radio should emphasize to the public at large the fact that a radio receiving set is destined to be a regular part of home equipment just as the talking machine or the piano. In the second place radio receiving sets are now being standardized and all the leading manufacturers realize that they must work with this point in view if they are to do successful business. A third point is that radio is passing from a plaything for the youth, to an educational and entertainment instrument for the adult, just so will the demand be for higher grade apparatus at fair prices which will be consistent with results to be obtained. The radio business as a whole will be much more quickly established if those in the business would concentrate on selling a few selected kinds of radio apparatus, instead of having in stock all kinds. It is this overloading with countless kinds of radio apparatus that has caused more failures of radio supply houses than anything else in the last two years. Stress should be laid upon the trade demanding **quality** and the buyer demanding **demcnstration** before buying, which will do more than anything else to bring about the production of higher grade radio apparatus."

Burndept of Canada Limited

Business Changes

Mr. W. H. Flewwelling is now in charge of the Toronto office of the Onward Manufacturing Company, and the Eureka Vacuum Cleaner Co.

Mr. J. W. Simmons, of the Fitzgerald Mfg. Co., Toronto, recently returned from his wedding trip to Vancouver, Los Angeles and Denver.

Sepco Automatic Heater Co., have recently moved to larger quarters at 39 Richmond St. East, from 47 Richmond East.

Mr. L. E. Flewwelling, of the Bright Light Elec., Ltd., 46 Queen St. East, Toronto, Ont., is taking on several new lines. These include the Sunnysuds Washer, Eureka Vacuum Cleaner and the National Electric Range. An extension of the activity with which Mr. Flewwelling has pushed his other lines in the past, will result in his putting over these appliances in a big way.

The Capital Electric Appliance Co., Ottawa, Ont., has obtained a charter.

Radio Tubes, Ltd., Toronto, Ont., has obtained a charter.



Where are the Radio Buyers?

A Wonderful Potential Market Exists

Our photographs answer the question, "What is the market for high grade complete sets?" They indicate the possibilities that exist for the dealer who wants the business badly enough to try for it.

Sometimes we overlook this potential business. Not many radio salesmen would imagine that the diminutive ice cream parlor on the corner would prove a likely place to sell a complete outfit, from storage battery to loud speaker, yet here we have just such a case. Mr. J. Cordaro was running his business with no cares or trouble until competition began to make him think that he would like to boom traed a little. "Radio" was presented as a wonderful thing to fill the bill, by a wideawake salesman. The result is seen in the photograph. The store now carries as part of its regular equipment. the large set with loud speaker. It is operated at all times of the day, when there is anything in the air, and it has done a lot to help business.

The other photograph illustrates the fact that there is a place for radio in the best homes of the community. Such customers demand the very best, and in this market we find an opportunity to place the highest grade of equipment. It is true that every pains must be taken with such an installation, but the reputation secured is worth a great deal of effort. The dealer who specializes in high grade complete sets, and has in him some part of the instincts of the salesman, can with confidence look for business among the best people of his district.

Radio is coming into its own as a means of entertainment. A large percentage of stores· restaurants and homes are potential customers for complete sets, and all that is needed to get the business is to go after it.

Three Successful Radio Men Tell How to do it

A Valuable Collection of Ideas for the Man who Sells

J. D. Ford Radio Equipment Co.:

Judging from the preliminary inquiries and sales at this period, the rest of the season is going to be a boomer. We can get parts and sets when ever we want them from the wholesalers and in addition to that the prices are holding steady which are two other reasons why I think radio business should be profitable myself. The radio merchandizing is settled down to regular business and the wild-cat stuff is being eliminated so if the same principles apply to it as in other lines we can hope for the radio merchant to be as successful as his aptitude allows.

It is a fact, of course that there is less competition. The mushroom crop of dealers has been weeded out and naturally this means something to the established man who understands the principles of the stuff which he is selling and is determined to give service to his customers.

I base my methods of securing new business upon well established lines of window displays and mail order and newspaper advertising. I might say in regard to newspaper space, I only use this once a week and then secure an advantageous position, perhaps on a radio page. The mailing list is easily acquired, consisting mainly of the fans in my neighborhood as given in the Government Blue Book.

I may say that "service" is one of the rocks that I have built my business on. I believe that when a customer is sold a complete radio set, or perhaps a very small part, that the sale is not complete and that the radio dealer has not done his duty either by himself or the business in general, if he does not make sure that the customer does understand the operation of that set and functioning of whatever part he may have sold.

It is true that wealthy folks buy more expensive equipment, but at the same time they demand more service and the middle class people buy more parts, but it must be remembered that on these parts there is a greater margin of profit. This means practically that to cover the whole business you can't exclude any one part of it. You have got to carry a line of reliable and dependable parts as well as high quality sets. The radio dealer who believes in closing up his shop at six o'clock at night is going to lose the greatest part of his business. I keep open every night and find that is the time I do most business. Saturday night is of course, the best in the week.

The Radio Shoppe (B. W. Ingleby):

. Radio business will be excellent this fall. The rush has started already. Broadly speaking it may be said that the bulk of the selling is in complete sets and parts.

Every sale involves a certain amount of servicing that cannot be avoided. Even if the purchaser already has an aerial, I always make a trip to his home. I do this because I believe that it is up to the electrical dealer to see that the apparatus which he sells gives satisfaction to his customers. I believe that radio is a specialty business that requires the utmost of attention from a man who understands the fundamental principles of the game. I find that the biggest buyers of radio are among those people who may be called the middle class. This is because the total purchases amount to more.

I have a mailing list and I might say in this regard, that the Government Blue Book is very useful as it gives the names of all owners of receiving sets, hence it provides an excellent basis for a mailing list.

Burndept of Canada (S. B. Trainer):

When you consider that the use of headphones on a set, limits the value of a receiving set you can appreciate what it means to enlarge the usefulness of a receiving set by having a satisfactory loud speaker which will interest and entertain a large number of people in a room instead of one or two people listening on headphones.

If the prospective buyer of a receiving set will insist upon finding a high grade loud speaker, he will be much be a much better satisfied user of a receiving set because he will get more out of his investment.

The difficulty about loud speakers in the past has been that many different makes have been rushed on the market to meet the radio demand with too little care given to the quality of the product. This has, during the last two years actually prevented the otherwise better progress of radio because it has given people the wrong impression about radio, when as a matter of fact the fault has rested upon an inefficient loud speaker, while the receiving set was alright and not at fault.

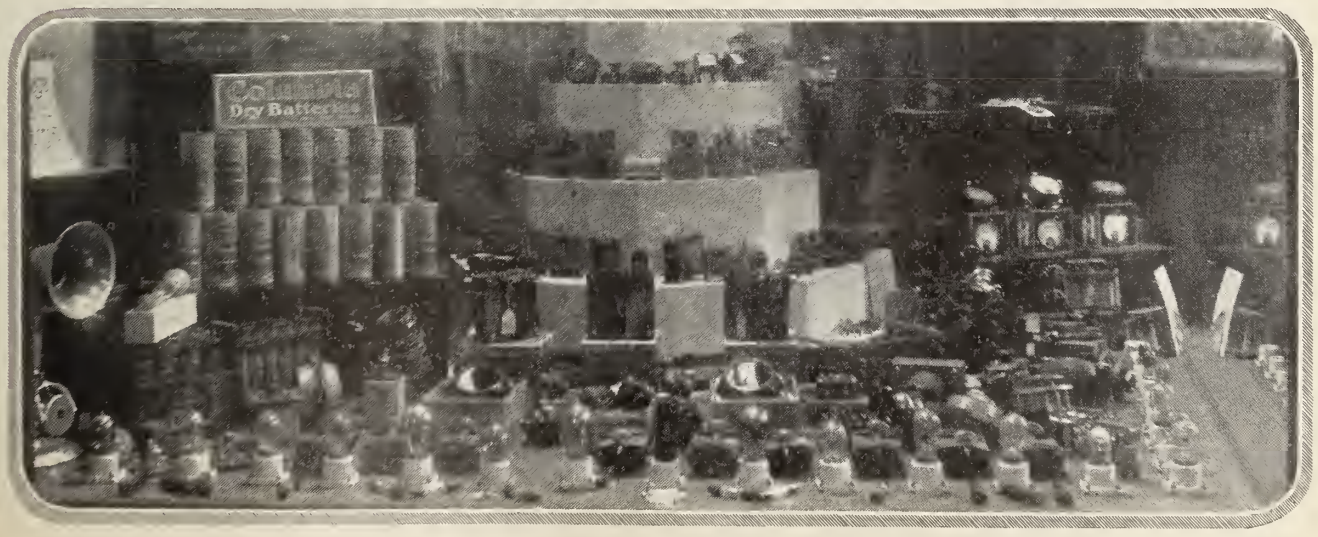
The "Punch" in these Windows Gets Business





The top photograph shows a recent window display by Mr. J. D. Ford. His store is on a good business street and he claims that many sales are directly traceable to window displays.

Our centre photograph shows an interesting display recently shown in the windows of the Canadian Radio Electric Co., 974 Danforth Ave., Toronto. The bottom photograph shows how Mr. B. W. Ingleby of the Radio Shoppe, Toronto, dresses a window.



 Oct 1, 1923

What Does This Mean?



Better Wiring—More Sales

Selling More Electricity

To the Builder— The Architect— and the Public

Red Seal Campaign Being Initiated by the Electric Service League, Toronto, Designed to Raise the Standard of House Wiring so as to Admit of the use, Without Further Outlay, of all the Necessary Electrical Household Appliances

The Electric Home League of Toronto, whose success in staging two modern electrical homes is now a matter of history, is launching a vigorous campaign in the interests of increased activities in contracting and merchandising.

The first move has been a change in name. It was felt that the term "Electric Home" tended to curtail the activities of the League both in actual fact and in the minds of the members of the industry. The name has, therefore, been changed to "Electric Service League (Inc.)" as having a wider application and the provincial government has issued supplementary letters patent approving the change.

The number of directors was originally five. This number has now been increased to twelve in order that the personnel of the executive may include every phase of the electrical industry. The board is now made up as follows. A. S. Edgar, president, Messrs. E. M. Ashworth, W. R. Ostrom, R. A. L. Gray, W. R. Carr, F. Jno. Bell, C. S. Barthe, J. Herbert Hall, C. H. Hopper, C. A. McLean, A. W. J. Stewart and R. T. Jeffery.

Three committees have been struck as follows: Finance committee, Messrs. Ashworth, Ostrom, Barthe, and Gray; Publicity, Messrs. Stewart, Barthe, Carr and McLean; Exhibition, Bell, Hopper, Hall and Jeffery.

The most important move of the League has been the appointment of a general manager in the person of G. W. Austen. Mr. Austen is a newspaper man of many years' standing, has had experience in organization work and has already given evidence of the great possibilities of service to the electrical industry which lie with such an organization as the Electric Service League. Plans are already complete for launching a vigorous campaign in the interests of better wired homes.

It is an unfortunate condition in Toronto, and

doubtless in many other centres where a considerable amount of building is going forward, that much of the construction work is in the hands of professional building contractors. These contractors have little interest in the proper equipment of their houses for the use of electrical appliances beyond the extent to which such equipment will help to sell the home or enable them to sell at a higher profit. In the past it has been difficult to convince these builders, but since the staging of the two electric homes mentioned above, the league has been called upon from time to time to give advice and offer suggestions. Out of this condition has developed a plan which will enable the builder, the contractor, and the Electrical Service League to work in unison.

The plan being developed by Mr. Austen at the present time, might be described as the "Red Seal Standard." A red seal, reproduced in miniature at the heading of this article, will be presented to the builder of every home who wires according to a certain minimum specification outlined by the Electric Service League. The actual seal will be large enough to be seen at a considerable distance— about 18 in. in diameter. There will be a space below where the electrical contractor will place his name and address. The minimum specifications as required by the Electric Service League are given below.

While it is too early to say to what extent this campaign will assist in improving the standard of electric wiring, a number of building contractors have expressed themselves very enthusiastically about it. It is evident on the surface that if the standard of a considerable percentage of our homes can be raised to that outlined in the minimum specifications, not only will the amount of business available for the electrical contractor be greatly increased, but the way will be opened for the sale of many more electrical appliances. As the public is brought to realize the value of these conveniences, they will little by little come to demand better installations. The builders and architects will thus automatically improve their specifications and the electrical industry will profit in proportion as it is enabled to give more and better service.

Literature, of course, is being prepared for distribution, particularly to builders and architects and the League will stand ready at all times to explain the advantages of the use of these minimum specifications to any citizen who is a prospective house builder.



Ceorge W. Austen, manager of the Electric Service League, Inc.

On the surface it would appear that the Autumn is not an opportune time to launch a campaign for the better wiring of new homes, but the League has felt that at best it will require several months to get the machinery for this campaign in working order. By the time the Spring season opens, the red seal campaign will be in full swing, and in a position to co-operate with the electrical contractors on all the construction work that is offering.

Minimum Red Seal Requirements

Houses 7 rooms and over—Three No. 2 wires. 100 ampere switch. Distribution box to have two extra 30 ampere fuse blocks. Circuit panel to have provision for two spare circuits. Range wiring (three No. 6's) to be completed to point in kitchen.

Houses 6 rooms and under—Three No. 4 wires. 100 ampere switch. Distribution box to have one extra 30 ampere fuse block. Circuit panel to have provision for two spare circuits. Range wiring (three No. 6's) to be completed to point in kitchen.

Lighting

Standard outlet in each room or main hall. Outlet on porch or main veranda, controlled from switch inside. Cellar stairway to have light, controlled from switch at top. Outlet in laundry over tubs. Outlet in front of furnace, unless other-wise lighted. Outlet over main stair turn, unless suitable illumination is provided by lower and upper hall lights.

Switches

All ceiling lights controlled from switches conveniently placed. Three-way switches on upstairs and downstairs hall lights.

Convenience Outlets

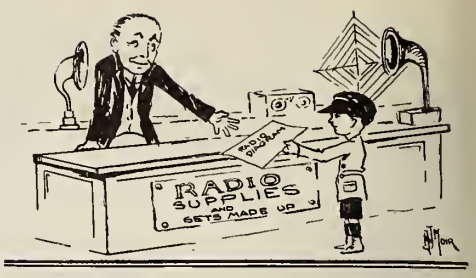
(Preferably Duplex or Twin Style)

2 in living room,
1 in dining room,
1 in kitchen,
1 in each bedroom,
2 in den or upstairs sitting room,
1 in sun room,
1 in laundry for washing machine, etc.
1 in sewing room, breakfast room, etc., (if any).

C. C. Bradly to Ottawa

C. C. Bradly, well known electrical contractor of Toronto, is removing to Ottawa, having received an appointment as teacher of electrical construction for the Technical School at Ottawa. Mr. Bradly previously taught at the Technical School at Toronto for 2 years, under the D.S.C.R. During the year of 1915 he enlisted with the Eaton Motor Machine Gun Battery, and served until his discharge in 1918.

What I Have Learned About Selling Radio

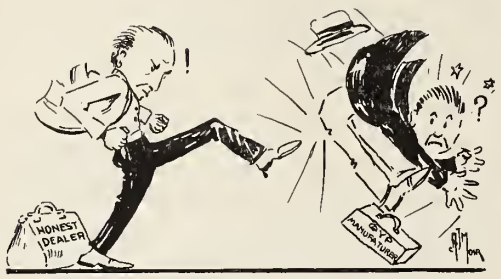


They Want the Best—be Conservative—Radio Yarns are Like Fish Stories—What to Carry in Stock

By A. L. AINSWORTH*

Much has been said in the last few months about the radio business, its ups and downs, etc., and the belief among a large number is that the radio game in general at present is more or less of a freak. A portion of this belief has a very good foundation due to the impression formed several months ago especially by certain manufacturers in parts of the United States and Canada, who were producing practically useless apparatus and even complete sets that it was almost impossible to make work.

A large number of people purchased these parts when good apparatus was scarce and paid amounts sufficiently large to buy good apparatus today, only to find to their chagrin that it was next to impossible to obtain any results. I heard of a certain case of a man who bought a tube socket and upon installing it in his set was unable to receive anything. He tried all methods to make his set work, tried substituting other condensers, coils, batteries, etc., but to no avail and finally consulted an expert who worked at the same set for a week or so, off and on, to try to locate the trouble. Finally the socket itself was tested for leakage and the base was found to be composed of a material which was almost a conductor instead of an



The gyp manufacturer is fast disappearing

insulator, having a resistance of only a few hundred ohms between terminals.

Times are Changing

But times are changing rapidly now. The "gyp" manufacturer is gradually disappearing and his products are obsolete now. The business is becoming standardized and on a basis with any other business such as the electrical, plumbing or clothing business. Cheap and poorly constructed apparatus cannot be easily sold now. The demand is for good reliable parts. The consumer does not mind paying a little more if he gets value for his money—he wants only the best. This holds good both for the small boy and the old radio fan alike.

During the past two years, the months of June, July and August have been fairly quiet. A certain portion of this fall in trade is due to a large percentage of people going away on vacations, etc., and another portion is due to natural causes such as static. However, summer radio is gradually coming into its own as sets and circuits are being continually developed to reduce static and interference and a large percentage are now taking small portable sets on their vacation, camping or fishing trips or automobile tour. Such circuits as the Flewwelling, Reflex, or Radio Frequency readily adapt themselves to this kind of use and by the development of such tubes as the peanut, W. D. 11 or U. V. 199 which may be operated from dry cells, it is possible to have a fairly large set and do away with the weight and disadvantage of a storage battery.

Bad Impression From Newspaper Reports

Due to a number of newspapers publishing stories and tales of the reception obtained by their readers, a wrong impression has been formed in the minds of a great many prospective purchasers of complete sets, namely, as to what may be expected from an average radio set. To a certain extent the stories of the results obtained by a radio fan can be classed with that of a fisherman, as I had a man come to me the other day who had purchased a small variocoupler, condenser and a peanut tube, and he declared that with an antenna in his bedroom he could pick up California stations any evening. When I wanted to call and hear these results he backed away from his statements.

I would suggest to any dealer that is selling complete sets to not picture to the customer such marvellous distant reception but place a more conservative range on the set, that is, a fairly dependable radius. If a set will pick up such stations as W.J.Z., W.G.Y., W.G.R., W.E.A.F., W.D.A.P., W.J.A.Z., etc., practically any evening, together with added distance under most favorable conditions, it is doing what should be expected of it. I am speaking about a regenerative set in conjunction with an amplifier. But the most satisfaction, both for the dealer and consumer, is in the sale of good standard parts which

*Salisbury Electric Co.

he may use in any number of circuits and if he does not obtain such marvellous reception it is not the fault of the parts and no hard feeling is caused. I think any dealer contemplating putting in a stock of radio apparatus would be wise to stock only the best standard apparatus.

What to Stock

It is in general necessary to have on hand a complete good set as radio fans may be classed in two sections. First is the amateur who is interested in experimenting with different sets and circuits and is continually building something new. He does not take much interest in the broadcasting programs but is desirous of learning the details of the different circuits and lives in hopes of developing something himself. This man usually buys only parts and is not interested in complete sets. The second is the individual who wants to hear good programs and does not care what is inside the box as long as he can be entertained when he wants to.

The biggest prospective customer of a radio set today is the farmer. Radio offers a wonderful opportunity for him. He may get the latest market reports, weather bulletins and entertainment during the long and lonesome evenings on the farm.

Fans Interested in New Circuits

The dealer will find a great advantage in constructing a set employing some new circuit and placing same in his window with complete parts for the assembling of such a set together, with a blue print showing the construction and a sign reading "This is the new such-and-such a circuit, price of complete parts cost so much. Ask us about this." It is the development of these new circuits and systems of reception that create a good percentage of business.

In conclusion, I think the dealer will be amply repaid by running small ads. regularly in the local daily or weekly newspaper. By advertising specials now and then it keeps the public interested in your advertising and will help to keep your name always before the eyes of the radio fan or prospective customer.

Radio Steers and Operates This Boat



A boat controlled by radio for a distance of three miles was demonstrated at the Canadian National Exhibition this year. This was the first public demonstration of radio control in Canada and was the culmination of experiments which had been carried out by Mr. Alfred Starr since 1908.

At the Exhibition a direct line was installed from the judges' stand on the waterfront to a radio station located two miles away. Direct control was thus obtained by means of a telegraph key. The operator was in full view of the boat and at the same time had control of the signals which operated it. The signals were received on the boat by a standard radio receiver Type C-21 manufactured by the Canadian Independent Telephone Co. The signals were then amplified and operated a super sensitive-relay of special construction. The radio receiver and relay operated throughout all the tests without a failure and any success which was met with was largely due to the consistent operation of the Canadian Independent receiver.

In this way a relay was operated on the boat in response to the operation of the key on shore. Signals were then used to operate a selector which served to operate the starting, stopping and steering mechanism. The rudder was operated by means of an electrical steering gear. By means of a special commutator the rudder was returned to central position automatically when the signal ceased. The boat was driven by means of a small 12 volt d. c. motor of approximately one-half h.p. capacity. A 12 volt storage battery was used to supply the current.

The Latest Developments in Electrical Equipment

Hotpoint New Model R Ranges, "P" & "C"

The following particulars give in condensed form some of the particulars of the new Hotpoint electric ranges, which were shown at Toronto Exhibition:

Body Construction

Almost entirely of steel; solid angle steel frame. Cooking surface and pieced and braced to withstand real heavy kitchen service. Inside edge of cooking top rounded eliminating cracks or crevices into which grease or dirt may gather. Oven of heavy gauge sheet steel outside and in; substantially insulated; inner lining of special vitreous enamel finish; will not rust or burn off. Side racks, broiler pan and elements all removable for cleaning. Corners rounded; no projections to hinder cleaning operation.

Patented Sheathed Wire Oven Units

Built into a welded steel frame; will not warp. Top and bottom elements interchangeable; 1250 watts each; give off an even distribution of heat; sheathing of special nickel-silver alloy which will stand action of heat indefinitely. Resister coils set inside a tube completely surrounded with infusible oxide and mica insulation. Steel frame formed into a guide which makes the withdrawal and replacing of units simple. Terminal construction such as to make contact solid and positive. Four terminals pro-



vided on each unit distributing load so that no terminal carries more current than those used on an ordinary flat iron. Terminal contacts very simple construction and easy of access. All live parts positively protected. Contacts all plated steel mounted in solid porcelain.

Patented Cast-in Sheathed Wire Surface Units

Element construction the same as oven units. Unit sections are wound to the required shape, placed in a mould and cast-in solid with soft grey iron. Substantial thickness of iron between top of unit and element. Terminals are located long distance from unit proper; are protected and air cooled. As fast as any open type unit once it is heated.

Magicoal Fires

Magicoal Electric Fires (Canada) Limited, 291 Mountain Street, Montreal, are marketing an elec-



tric grate of the type shown in the illustration. New models are presented in this year's line, both for socket and permanent installation.

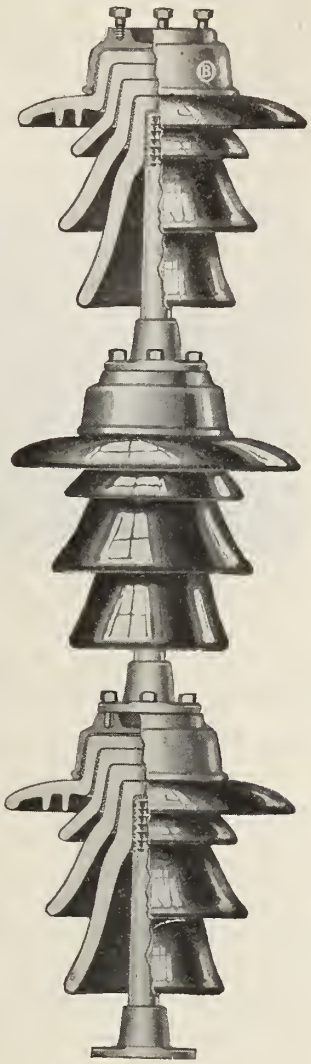
White Cross Electric Heater

The National Stamping & Electric works, 3212-50 West Lake Street, Chicago, Ill., are manufacturing an electric heater of novel design. This heater has a



sparkling nickle finish, and is 8½ x 9 x 13 inches in size. It weighs 4 lbs., and has a quick adjustable copper reflector. The pedestal is 5 inches wide at the base. It is shown in the accompanying illustration.

Pillar Insulator by Dominion Insulator & Mfg. Co.



Several insulator units for bus bar and switch use have recently been added to the catalog line of The Dominion Insulator & Mfg. Co., Limited. These units are made in several sizes in types for different conditions of voltage and mechanical loading, but are alike in that they are made so that several units can be bolted together to form a pillar of switch insulator of the desired height. The individual units of the pillar insulator shown in the illustration are each twenty inches high and seventeen inches in diameter. Each unit is rated at 66,000 volts, and the pillar consisting of three units at 200,000 volts. All parts are assembled accurately and units are fully interchangeable. Metal parts are given a smooth uniform coating of zinc by the hot-dip process.

Duquesne Kitchen Luminaire

A new kitchen lighting unit is being placed on the market by the Consolidated Lamp and Glass Company of Coraopolis, Pa. The Duquesne Kitchen



Luminaire was designed by F. W. Loomis, illuminating engineer of the Duquesne Light Company of Pittsburgh. It is merchandized by a plan developed by H. A. Keys, vice-president of the Equitable Sales Company of Pittsburgh. The volume of sales obtained through the merchandising plan as proved out in Pittsburgh, presage a large and growing success for the new Duquesne Kitchen Luminaire.

Majestic Heaters

The illustration shows No. 7, a single coil favorite by Renfrew Electric Products.



Larger Bank Accounts

The Edison Mazda Blue Book which is now being distributed to Mazda agents throughout Canada, is the finest piece of illumination literature, from the dealer's point of view, that has ever been produced. The primary purpose of the book is to place in the hands of C. G. E. agents a complete description of the company's advertising plans for the coming season, but in addition to this outline the book contains a great deal of valuable and interesting information that dealers will appreciate. For example, a short dissertation on the subject "Who pays for Advertising?" is a very logical presentation of this subject, as is another short article on "Advertised versus Unadvertised Goods."

The campaign of consumer advertising outlined by the Canadian General Electric Company for this Winter's season is very carefully outlined. It is explained that 44 different newspapers will be used covering the whole of Canada and a schedule is definitely set forth showing exactly what advertisements will be used in these papers and the exact dates. The advertisements themselves, reproduced in the book, are most attractive.

Some splendid information is also given on the value of window and counter display. Figures showing the number of people who pass windows in towns of varying populations are given, and a number of experiences of agents related where window displays have produced a big increase in sales. Another article explains "How to Make a Display," with actual drawings of windows; and a number of excellent photographs show how the window and window back-ground and the display itself may be laid out.



President Harding speaking in Vancouver. The microphones of the Northern Electric Public Address System are visible



A photograph that shows the amplifier horns, as arranged in Vancouver for President Harding's address

Northern Electric Public Address System

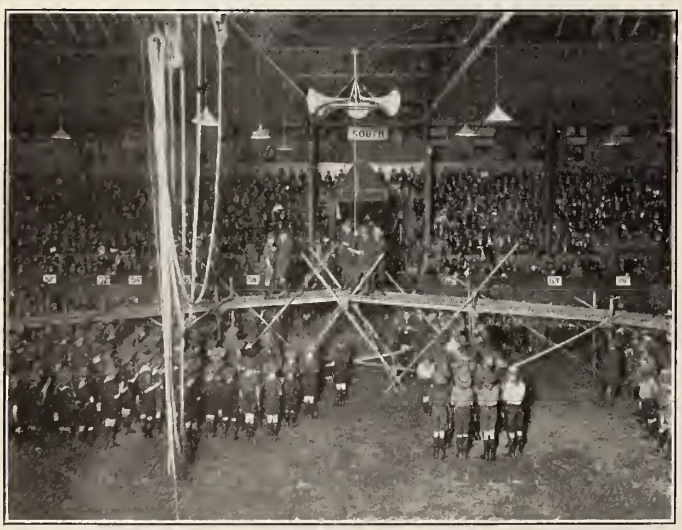
An Up-to-date Method of Amplifying a Speaker's Voice That is Becoming Very Popular

The Northern Electric Company Public Address System is becoming more and more in demand throughout Canada, its latest achievement being staged in Vancouver on the occasion of the late President Harding's visit to British Columbia.

The equipment was shipped from the Montreal factory of the Northern Electric Company, where it was manufactured, and demonstrated by P. E. B. Demers, one of the Company's Transmission Engineers who accompanied the equipment on its Western journey. Prior to this, Montreal people were introduced to the wonders of this new Canadian product.

On May 24th last, on the occasion of the Empire Day Celebration held in Victoria Square, thousands of listeners were enabled to hear every word of the many patriotic addresses delivered in addition to which the Royal Record, recording the King's and Queen's messages to the Children of the Empire, and made by the Berliner Gram-o-phone Company by special command of His Majesty, was broadcast, quite a feature in itself when one considers several thousands of people listening to a gram-o-phone record in the open air and in a public square of a large city.

On another occasion the same Public Address System was used to distinct advantage in the Mount Royal Arena where the packed audience, estimated at 4000, was enabled to hear quite distinctly the address to the Boy Scouts by Major General Sir Robert Baden Powell.



The system being used in Mount Royal Arena, Montreal, when Baden Powell addressed 4,000 people



Thousands gathered on May 24 last, in Victoria Square, Montreal, to hear messages from the King and Queen, made audible by this equipment

Current News and Notes

Almonte, Ont.

The plant of the Almonte Electric Company, Almonte, Ont., was recently damaged by fire.

Barton Township, Ont.

Hydro extensions through the rural section of Barton and the northern part of Glanford townships will be undertaken by the Hydro-electric Power Commission of Ontario.

Brantford, Ont.

Brantford Hydro shows continued gains in service and earnings. There is today a surplus of $9,000 for the first nine months of the year, as compared with $3,000 for the same period last year, total earnings jumping in the same period from $129,000 to $163,000, a gain of $34,000.

Brampton, Ont.

It is likely that the northern section of Chinguacousy Township will be supplied with light and power by the Cataract Light and Power Company, of Cataract, on the Credit River, who are asking for a franchise for that purpose. As a great many ratepayers are asking the council for light and power, with special requests from Mono Road, Cheltenham and Claude, it is likely that after the council has viewed the power plant, and secured an agreement from the company, that in the near future a by-law will be submitted.

Clinton, Ont.

An extension of the hydro line from Clinton to Bayfield, Ont., is contemplated.

Cobalt, Ont.

The Northern Ontario Power Co. have completed the job of doubling the power supply of South Lorrain Silver Camp. This will mean larger and steadier operations at the Mining Corporation and Keeley properties. It will also permit Lorrain Consolidated to make a commencement of actual mining. Consolidated has been delayed some time waiting for a full power supply.

Christieville, Ont.

The Christie-Henderson lime kiln at Christieville is to be operated by Hydro power. Electrician Gus Huether has started his gang of men on the installing of five motors. When the present work is completed and in operation this firm will have one of the most up-to-date operating systems in the province.

Fergus, Ont.

The Hydro sub-station at Fergus, Ont., recently suffered from a blaze caused by lightning. Power was on again in a short time.

Florence, Ont.

Thomas Bros., Oil Springs, Ont., have purchased the plant of the Florence Electric Light Company.

Fredericton, N. B.

Hon. P. J. Veniot, premier of New Brunswick, announced that the development of power of the Grand Falls would be undertaken by the provincial government, should it be proved that the electricity could be provided at $180 per h.p. or less.

Halifax, N. S.

The English cable ship Faraday, which has been engaged in laying the new Postal Telegraph Commercial cable from Far Rockaway, N.Y., to Canso, N.S., arrived in port on Sept. 12 reporting that she had lost the end of the cable when 900 miles had been laid and two days' search failed to locate it. This is the largest cable in the world of its kind and is being laid also from Canso to the Azores by the Colonia, largest cable ship in the world. The Faraday, after a fruitless search for the broken end of the cable, proceeded to Canso and laid the shore end, which was marked with buoys, and will now go to New York to commence an attempt to trail the cable to the broken end. Officers of the Faraday reported that the Colonia had laid 2,000 miles of the Canso-Azores stretch.

Kitchener, Ont.

The Kitchener Light Commission has decided that a straight five-cent fare will be charged on the new Bridgeport line, which is to be shortly linked with the Kitchener and Waterloo Street Railway. In addition to this, if a transfer is needed to any part of Kitchener or Waterloo not covered by the Bridgeport line, an additional cent will be charged for the transfer.

Komoka, Ont.

Hundreds of Lobo Township residents gathered at Komoka on Sept. 14 when Sir Adam Beck pressed the button that gave Hydro to the township. Electric power was thus secured after a battle of many years. The bill was not carried until the Township Council had been un-seated.

Melville, Sask.

The municipal electric light and power plant at Melville, Sask., was gutted by fire recently, causing an estimated loss of $100,000.

Milton, Ont.

Mr. R. W. Philp has accepted the position of Manager for the Water and Light Commission of Milton and will take up his new duties on Oct. 1st.

Mimico, Ont.

As the result of the report of the Public Utilities

Commission to the Town Council of Mimico, Ont., that the load carried by the New Toronto Hydro sub-station was becoming too great for its capacity, and that Mimico would have to have a sub-station of its own, a resolution was passed instructing the town clerk to arrange for the selling of $45,000 debenture bonds for the building of the station and its maintenance. Ten years ago only 50 horse-power was required for Mimico's use. Seven years ago this was increased to 250 horse-power, and to-day it has mounted to nearly 1,000 h.p.

Montreal, Que.

It was announced on Sept. 7 that the final terms of the agreement between the city of Montreal and the Back River Power Company for the necessary protection of sewer outlets on the Riviere des Prairies, as well as streets abutting on the river, had been completed, so as to enable the company to proceed with the construction of a power dam below Cedar Island, which is to develop 50,000 horse power.

New Westminster, B.C.

Messrs. Hume and Rumble had a fine showing of electrical goods at the Provincial Exhibition. This included a first class radio set with loud speaker in Fred Hume's booth which attracted much attention.

North York Township, Ont.

A by-law calling for an expenditure of $110,000 for the installation of a Hydro system in the eastern and western parts of the township was passed at a special meeting of North York Township Council on Sept. 13. The cost in the Yonge St. section is $80,000 and the western district $30,000. The council instructed Engineer E. A. James to call for tenders for the installation of the system. Council authorized the Ontario Hydro-electric Commission to make arrangements with the Toronto and Western Hydro Commissions to inaugurate an immediate service.

At the meeting of the North York Township Council, on Sept. 17, the agreement between the Ontario Hydro-electric Commission and the township was signed by Reeve Hicks, representing the township. This means the ratepayers of the township will buy their light and power from the Hydro-electric System for a term of 30 years.

Owen Sound, Ont.

Niagara power will soon be supplied to the Eugenia system.

A transmission line has been built between Harriston, the point furthest north on the Niagara system, to Mt. Forest, the most southerly point on the Eugenia lines. At Mount Forest there is a frequency changing station. This station changes the frequency of the Niagara current from 25 to 60 cycles for the Eugenia system.

The new connection will provide a continuous current of 1,000 h.p. on the Eugenia system when the Niagara plant is off the peak load. The Eugenia system will be used during the peak periods and will be capable of supplying 8,000 h.p. During other periods the water supply at Eugenia will be conserved and the full load carried from Niagara.

Ottawa, Ont.

Robert J. Durley, secretary of the Canadian Engineering Standards Association, has returned to Ottawa from Geneva where he represented Canada at the International Conference on Industrial and Engineering Standardization.

Pain Court, Ont.

An agitation is to be revived with the view of securing Hydro service for Pain Court, Ont. It is reported that many farmers in that vicinity are anxious to enjoy the advantages of the service, and intend to use every effort with the view of securing the required number of contracts to warrant the Hydro authorities laying cables. Hydro cables have been laid for several miles along the river road, and most of the farmers whose property is adjacent to the pavement have installed the electric service in their homes.

Peterboro', Ont.

Sir Henry Thornton has advised the city that the operation of gasoline-electric cars by the Canadian National Railways in Peterboro' district and the advisability of extending the Toronto & Eastern electric line from Bowmanville to Peterboro' will be considered at an early date.

Pictou County, N. S.

W. I. Snook is the general contractor on the 66,000 volt line from Hopewell to Stellarton, and on the 13,200 volt line from Stellarton to Pictou. These lines are part of the Sheet Harbour System of the Nova Scotia Power Commission.

Port Arthur, Ont.

Upward of 150 men are now employed at Cameron Falls preparing to commence active work on the two new units which are to be installed at the falls. It is expected between 200 and 300 men will be on the job by the end of the present month.

Port Elgin, N. B.

The village of Port Elgin, Westmorland, N.B., has been authorized to issue bonds to the extent of $10,000 to purchase land, erect a power house, and install a plant to supply light for the village.

Quebec, Que.

The Laurentian Hydro Power Company, a recently organized company with privileges of exploitation in the counties of Labelle, Terrebonne, Joliette and other sections has issued $250,000 worth of bonds.

The Limoilou and Ste. Anne shops of the Quebec Power Company are to be removed to Montmorency Falls, where there are at present certain works going on. The object is to unite at one point all the larger shops of the company with the added advantage of

being in close proximity to the Montmorency Division.

The Provincial Government of Quebec, has decided to offer for lease by public auction, on the 16th of October three groups of water power rapids on the Megiscane river, in the County of Temiscamingue. The first group is located below the outlet of Lake Failon at three miles from the Transcontinental, and the gross minimum power is estimated at about 7,600 h.p. The second group is in the Township of Dollard with a minimum gross power said to reach 2,600 h.p. The third group is situated in the same township and the minimum power to be developed is set at 7,000 h.p. The lessee must undertake the establishment of a 100 ton pulp mill within three years.

The Hull Electric Co. intends to apply for authorization to have a dam constructed on the Gatineau River, near the townships of Aylwin, Hincks and Delholm. The dam in question is part of the big power development projected by the Hull Electric Co. at the Pougan Falls, which is to cost approximately $6,000,000 and furnish the company with 60,000 additional h.p. G. Gordon Gale, vice-president of the company, stated that it is the intention of the company to start work on the big project early next spring.

St. Jerome, Que.

The Canadian Comstock Co., Ltd., have been awarded the contract for the construction of a power line from St. Jerome, Que., to Lachute, Que. J. C. Wilson Ltd., are the owners of the line. Wm. I. Bishop Ltd., is the general contractor for the dam and power house on the North River near St. Jerome.

St. John, N. B.

P. B. Yates, of St. Catharines Ontario, who for some months has been acting as manager for the civic power commission here, has terminated the engagement.

The matter of rates for current, should the New Brunswick Power Company be called upon to furnish it to the New Brunswick Electric Power Commission, to help out the Musquash development, was recently discussed by Gordon Kribs, representing the New Brunswick Electric Power Commission, and M. A. Pooler, general manager of the New Brunswick Power Company. Mr. Pooler informed the commission that the power company would be able to handle the load of the commission until December, but as that was the heaviest month, they would not be able to render any assistance during that month.

Two power lines, each carrying 66,000 volts, are now in use between St. John and the Musquash.

Budleigh Faraday, of Montreal, has been appointed commercial manager of the New Brunswick Power Company. Mr. Faraday was formerly with the Southern Canada Power Company.

Toronto, Ont.

In a printed statement handed out in connection with his address before the Public Ownership League of America on September 10, Sir Adam Beck urged the development of the power resources of the St. Lawrence River by Ontario and the adjacent states jointly as a public ownership enterprise. The international portion of the St. Lawrence, in the vicinity of Morrisburg and the Long Sault Rapids, said Sir Adam, is capable of producing 1,600,000 horse power, of which 800,000 horse power would be owned by Ontario and 800,000 by United States interests.

The Toronto Hydro-electric System have purchased a site for a sub-station at the corner of Danforth Ave. and Morton Road, Toronto.

Trenton, Ont.

It is proposed to extend rural Hydro lines in the vicinity of Trenton, Ont. A meeting of all farmers in the Trenton Wooler area is to be called at an early date, when questions of costs, power, etc., will be discussed. If there are sufficient signers work will be commenced by the last of next month at the latest.

Whitecliffe, B. C.

The contract for the construction of a 22-mile power line from Whitecliffe to Britannia Beach, B.C., for the B.C. Electric Railway Co. has been awarded to D. Cummings, 431 Seymour St., Vancouver.

Winnipeg, Man.

Work has been started on the excavation for the Winnipeg Standby plant.

Private enterprise has made tremendous strides in electrical heating schemes for big buildings and private homes, F. A. Cambridge, city electrician, stated recently. This summer three large projects have been undertaken for public and commercial buildings and there are several systems now being tried out for the heating of houses. Under the direction of the inventor, M. de Kermor, a 900 h.p. electrical heater is being constructed for Grace hospital. The Children's home has in prospect installation of electrical heating, and the Northwest Laundry is installing a 500 h.p. heater, Mr. Cambridge said. "To my knowledge there are different systems of electrical heating now being installed in private homes, all of which will be operated with off-peak power. The houses are specially constructed with lining of wool mineral to conserve the heat and reduce costs and there is every indication this form of heating will become increasingly popular," he said. An engineer from the Underwriters' Laboratories arrived in Winnipeg on Sept. 18th, to make tests of the de Kermor heaters.

John J. O'Brien, secretary and Winnipeg manager of the Northern Construction Co., has left Winnipeg for Montreal, where he will open an eastern head office for the company. Mr. O'Brien has been connected with much of the larger construction work

from the head of the lakes to Vancouver during recent years, including the Winnipeg aqueduct, the Manitoba Power Co.'s hydro-electric development at Great Falls, and the Canadian National main line to Vancouver.

Woodstock, N. B.

The Carleton Electric Co., Ltd., has been incorporated with head office in Woodstock and capital stock of $99,000. The company will construct a power line from Bridgewater to Woodstock. Contract for poles has been let to Robert Carvell, of Lakeville.

Contracts Awarded

Fairville, N. B.

Vaughan Electric Co., St. John, N. B., $70,000 Orphanage.

Galt, Ont.

H. Lyall, 43 W. Main St., $5,500 house on Brant Road.

Scott & Bennett, $5,000 house on Blair Road.

Hanover, Ont.

C. Ross & Sutherland, $60,000 high school.

Haileybury, Ont.

W. Clutchley, Haileybury, Ont., $30,000 bank.

Hamilton, Ont.

W. C. Reid, Charlton Ave., $30,000 addition to school.

Halifax, N. S.

Thos. W. Robinson, 44 Almon St., $5,000 house on Chestnut St.; $7,000 house on Henry St.

Arthur Conn, 114 Argyle St., $8,000 house on Cambridge St.

Melville, Sask.

E. H. Motter, Melville, Sask., $1,000 store on 3rd Ave.

Montreal, Que.

Mr. Gingras, care 3127 Henri Julien, $6,000 house on Henri Julien Ave.

Vincent & Say, repairs to bank costing $30,000 on St. James St.

D. Verville, 1338 St. Valier, public garage on St. Hubert.

W. D. Marchand, 25 Park Ave., $25,000 addition to plant on Beaver Hall Hill.

Collyer & Brock, 131 St. Alexander, $20,000 house on Pine Ave.

W. Staines, 527 Cadieux, $150,000 apartment house on Dorchester St.

S. Neyrinck, 802 De Gaspe, residence on Eastern Ave.

J. A. St. Amour, 2171 St. Denis, $65,000 convent.

Philip Lahee & Co., marine tower jetty and transit sheds for Harbor Commissioners.

Canadian Comstock Co., Ltd., $1,100,000 office building on Bleury St.

Annual Financial Review

It is often said that every business should have a fair percentage of its assets invested in good securities to act as an anchor in time of trouble. Sometimes the surplus assets go back into the business; sometimes they are kept in the bank but—sometimes—they are used to buy L. R. Steel or other worthless stock.

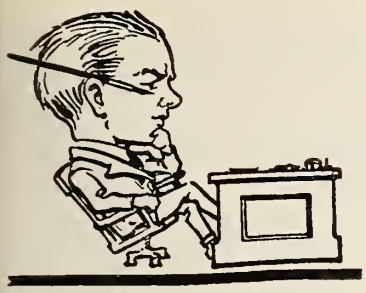
The Annual Financial Review published each year by Houston's Standard Publications, Toronto, contains valuable and entirely reliable data on all securities listed on the Toronto and Montreal Stock Exchanges, as well as on many other Canadian undertakings. It contains the current annual statements of companies; the highest and lowest prices of stocks and bonds (government, industrial, municipal &c.) for each month for ten years; rate of earnings and dividends paid for several years and other important items in the history of the different companies such as increases in capital stock, particulars of franchises, dates bonds are redeemable, and a mass of other facts which, taken together, enable the investor to make a personal study of any security before spending his money. The book has grown until the last edition, just off the press, which brings everything up to date of June 1923, contains 792 pages; cost $10.00. It is an invaluable book for the general investing public.

John Starr Son & Co., Give up Electrical Supply Business

The old established firm of John Starr, Son & Co., St. John, N. B., have made an announcement to the effect that they have disposed of their wholesale electrical supply jobbing business, stock and good-will, to the Northern Electric Company, Ltd. The Starr firm will operate under the old name but will concentrate all their efforts on the distribution of farm lighting plants and electrical appliances, including the Delco lighting and water pumping plant, the Apex vacuum cleaner, the Rotarex washer and ironer, and various makes of the smaller domestic appliances. The Northern Electric Company undertakes to continue the high standard of service and fair treatment which John Starr Son & Company have always meted out to their customers, while John Starr & Company can be depended upon to continue the same clean-cut policy as in the past.

C. D. Henderson Resigns from A.B.C.

Cyril D. Henderson, president of the Henderson Business Service Ltd., who for the past three years has also been Canadian manager for Altorfer Bros. Co., makers of A.B.C. washers and ironers, has resigned from the latter organization. Mr. Henderson, of course, will still continue his active interest in the Henderson Business Service, Ltd.



The Editor Comments

Every Man is Needed

Longer evenings cut down our out-door play hours, and we plan indoor occupations to take their places. In this coming season we should allot a definite amount of time for league and association work. There is hardly a man in any branch of the electrical business who is not within the district of some electrical organization which is working for the good of the industry at large, and he can help matters along by lending his personal assistance.

Against this we have heard men say, "I will have nothing to do with organization schemes, because they were not successful in the past. I am getting along all right by myself." The maker of such statement can have little vision, or he would see that any good work he can do in his local association is bound to ultimately help himself. Association work is not philanthropic. If the existing conduct of association matters does not suit a man, he should exert his influence to improve them.

Curiosities Become Necessities

Radio has permeated our lives. There is hardly a printed page that does not contain some reference to the subject. It exists everywhere, and we have even heard the grouch who maintains that it is impossible to escape it.

Just how important this development is to the electrical industry, can only be realized by casting a glance backward at the history of other equipment designed essentially for the home. Take for instance the telephone or the phonograph or the electric light. At first these were curiosities, then they became the luxuries of the favored few, and now they are found in hundreds of thousands of homes throughout the breadth of the land. The manufacture and sale of these articles now represent scores of millions of dollars annually. Radio will follow a similar course.

It is difficult to realize this at the present time. The various difficulties that always beset a new industry have cropped up in the radio field, and prevent a true perspective being obtained. Now, however, these difficulties are being cleared away, and with them a clogging mass of undesirable associations. Radio is getting into the right hands, and it will grow. The men now coming to the front are the future leaders of an immense industry, where their present efforts will be largely rewarded.

This issue of the Electrical News gives a fair indication of how matters stand at the moment. We note the adoption of radio by an immense central station system, the great demand for it as a means of entertainment by ultimate consumers, and the fact that the merchandising end of the business is gradually getting on its feet. The very fact that its adoption in the central station system was an innovation, that a huge consumer demand appears extraordinary, and that the merchandising end of the business is not yet entirely stable, are indications of its newness. The situation is nevertheless, undoubtedly encouraging, and we believe that faith is the main thing required today to boost radio to its proper place.

Unjustifiable "Detached" Attitude

There are notable exceptions, but in many cases, central station executives are prone to regard the merchandising end of the electrical industry as something not quite within their ken. They realize the importance of the domestic load, but do not make it their business to keep special tab on the methods used to promote it.

An attitude of even more profound detachment is assumed by certain engineers, whose interests lie in the manufacturing end of the industry. They care little about the merchandising of electrical appliances, in fact they do not realize its importance, somehow not understanding that the generators and transformers which they really do worry about, will ultimately be engaged in supplying electricity to these same appliances.

Plenty of excuses exist for the attitudes adopted by the two types mentioned. One has his hands so full of executive work already, that he can not squeeze anything else into his program. The other is also busy, and in addition, may be so entirely out of touch with the merchandising end of the game, that he is not familiar with the workings of even the most common domestic appliances.

It is not our suggestion that these men should throw themselves with great energy into the work that is being continually carried on for the popularizing of electrical appliances and towards the education of the public to better wiring. Such a course would be impossible in many cases, and injudicious

in others. What they should do though, in fact, what they owe to the industry that supports them, is to watch the activity that is going on in their districts, and where possible lend a helping hand. It is true that the jobs of running a large power plant, or maintaining a transmission line, or designing transformers are not exactly like the jobs of selling electric washing machines, or wiring houses, or installing fixtures. The jobs are different, but there is a tie that holds them together forever as part of the same industry, they are all dependent upon electricity, without which they are nothing.

Each part of the industry helps support the other, and a better understanding and co-operation is essential among the different branches before we can achieve to the full benefits that became potentially possible when Nature endowed us with our wonderful water-powers.

Second International Conference of Standardization Bodies

In 1921, the first conference of the secretaries of the various national standardizing bodies was held in London. In July, 1923, a second conference of a similar nature was held in Switzerland, at which the standardizing organizations of thirteen countries were represented. The sittings at this conference extended over five days, and it was attended by delegates from the following countries: Austria, Belgium, Canada, Czechoslovakia, France, Germany, Great Britain, Holland, Italy, Norway, Sweden, Switzerland and the United States. The Canadian delegate was R. J. Durley, secretary Canadian Engineering Standards Association.

One of the principal tasks at the conference was the interchange of information between the delegates with a view to furthering international co-operation and the development of engineering and other industrial standards along parallel lines. Arrangements made with this view at the first conference were considered in the light of the experience since gained, and modifications suggested by this experience were discussed. It is evidently important for this purpose that the interchange of information regarding proposed standards, whether dimensional or other, should take place at the earliest possible stage of their development, and it is believed that the steps taken at the conference will lead to marked improvements in this respect.

Among other topics dealt with may be mentioned, —the methods to be adopted for promoting the practical use of published standards in the various countries; the means to be employed for giving publicity to the work, and informing the public as to the advantages of standardization; the interchange of information as to the organization and working methods adopted by the various standardizing offices. Provision was made for continuing the work of the conference, and a committee was appointed to deal with the difficulty which has arisen in finding the exact equivalents in various languages for the technical terms used in standardization.

Sales Tax Refund

In connection with the new Sales Act which goes into effect January 1, 1924, manufacturers and wholesalers are reminded in a C.M.A. circular that those who desire to make application for deduction of the sales tax paid on materials on hand the first day of January, 1924, in respect of goods which have been, are being, or are to be used in, wrought into or attached to articles to be manufactured or purchased for sale, which articles are subject to sales tax, shall signify their intention of so doing in writing to the Collector of Customs on or before the 1st. day of December, 1923, and shall submit an inventory in duplicate to the Collector of Customs at the port in which the business is located, not later than March 31, 1924.

In connection with refunds of sales tax on returned goods, the Department of Customs announces that where goods are returned as unsatisfactory or damaged in transit and where goods of the same value are supplied in exchange, no charge being made for the goods so supplied, no tax is chargeable on the goods supplied in exchange. Where the articles supplied in exchange are of greater value, sales tax is collectable on the difference in value. Where the goods supplied are of less value, the amount of tax on the difference will be refunded. In the case of goods being damaged, necessitating their destruction, a refund of the tax will be made but goods to replace those destroyed will be subject to the usual tax.

No Record of Diversion

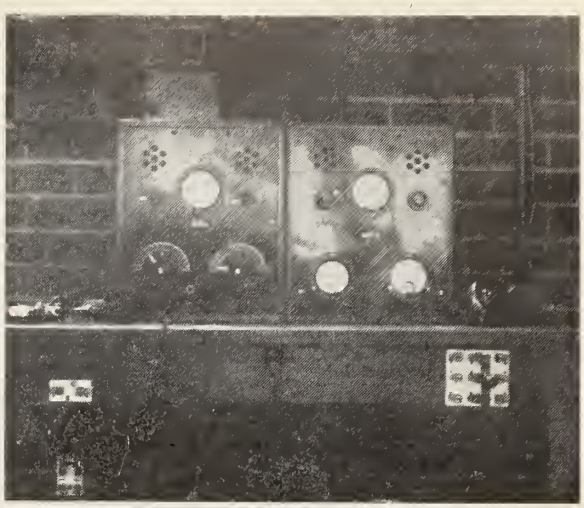
That Canada has no record showing the consent of the people of this Dominion to the diversion of the waters of Lake Michigan, as is being done by the Chicago Sanitary District, was the stand taken by Sir Adam Beck when a deputation from Chicago appeared at the Hydro offices in an attempt to justify their action. The Ontario Government apparently placed great importance on the conference inasmuch as Hon. W. F. Nickle, K.C., Attorney-General, was present to hear what the Chicago men had to say. Representing Chicago were W. J. Healy, president of the Sanitary District; L. K. Sherman and George M. Wisner, engineers, and Edmund E. Adcock, counsel.

A tentative programme for the 1923 convention of the Association of Electragists, International, has been received. Dates are given as October 8 to 12, and an interesting programme is laid out.

Radio has been Adopted for Emergency Communication

Guided Wave System of Ontario Hydro-electric Power Commission Connects All Stations of Niagara System

By F. K. D'ALTON
Assistant Laboratory Engineer, H. E. P. C. of Ontario



A typical installation

It will be realized that a power transmission system, which depends for its smooth operation upon the messages sent from station to station, must have a dependable method of sending and receiving these messages. The physical telephone is satisfactory until interrupted by induction, an open circuit or other troubles in the lines, at which time some other method must be used. For communication under such conditions, which we may call "Emergency Communications," radio equipment has been installed in the generating and transformer stations of many power systems.

Radio, considered as a method of communication by means of electric currents of high frequency, may be used in three ways,—

(1) Straight Radio—where energy is radiated from an aerial wire and is propagated through the ether in all directions, being receivable at any point within the range of the equipment.

(2) Guided Radio—where the energy is radiated from an aerial in the proximity of a power transmission line, a large part of this energy being absorbed by the line conducted along the line and finally re-radiated. Another aerial near the line will collect some of the energy and lead it to an ordinary radio receiver.

(3) Carrier-current communication—where the high frequency output of a radio transmitter is passed through small condensers to telephone lines, and along these lines to a radio receiver at the distant end.

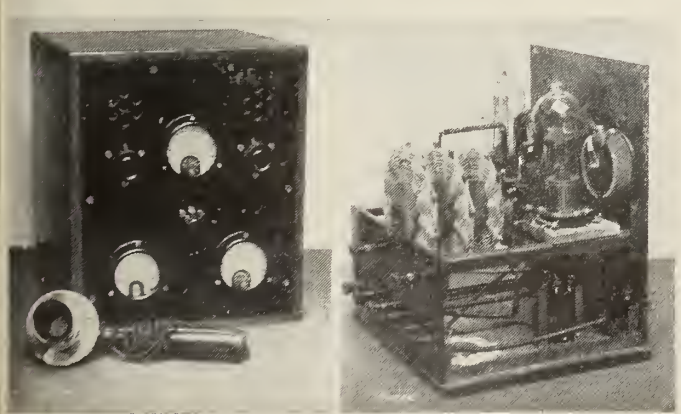


Fig. 1—Two tube transmitter

On account of the higher efficiency of the guided radio system and in order to provide a means of communication which would be independent of the land telephone lines, the Hydro-electric Power Commission of Ontario decided to install suitable guided radio telephone equipment at all high tension transformer stations on the Niagara System, and thus to make use of the 110,000 volt power lines for communication as well as for power transmission. These radio telephone sets were to be transferable to the physical telephone lines so that alternative channels would be available and communication would be fairly sure in the event of trouble on either the power or the telephone lines, or even in case of interruptions on both systems.

The development and installation of this equipment was undertaken by the Laboratories of the Commission and considerable development work has been done in order to bring the equipment to the state of highest efficiency.

The aerials at all stations have been erected between the steel towers which support the power lines. At many stations the ground wire above the power lines has been insulated and used as an aerial; at other stations the aerial wires have been strung below the power lines.

Some of our aerials are of the inverted "L" type running in one direction only but able to communicate in both directions, others are the "T" design and run in both directions from the stations.

We have experimented with both long and short aerials and have found that a "T" aerial of one conductor approximately 900 ft. long and located about 10 ft. above the power lines gives the most satisfactory, consistent results.

For grounding our sets connection is made to the ground bus of the transformer station.

We have two types of transmitters in operation

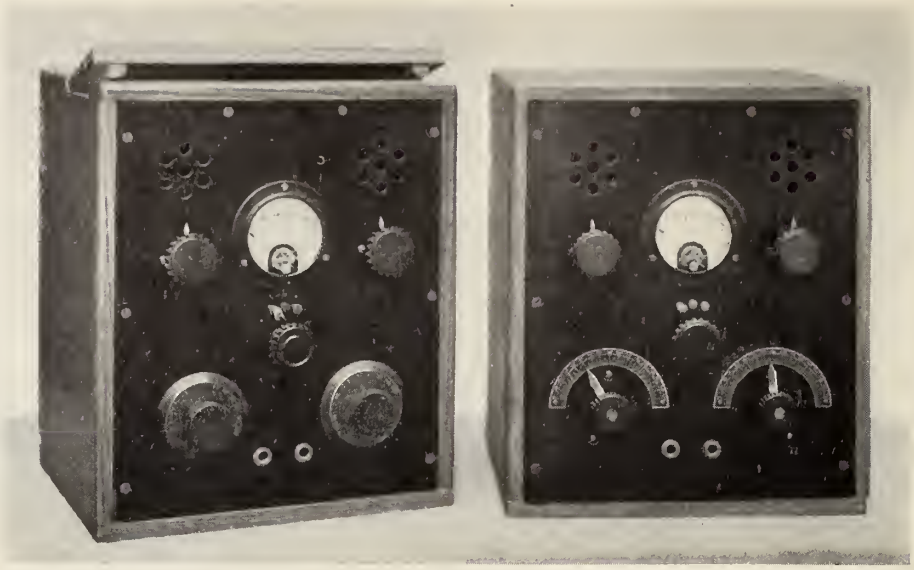


Fig. 3—Front view of receiver. This type uses two 3-element tubes, one for detection and one for audio frequency amplification.

on our Niagara System. In four of these transmitters a constant current method of modulation is used, whereas in the remaining eleven transmitters the voice frequency voltages are applied directly to the grid of the generating tube.

A rear inside view of one of the transmitters of the former type is given in Fig. 1. Two power tubes are used in each transmitter and these together with necessary control rheostats and the noise filter are contained in one cabinet. The inductance coils by means of which adjustment for wave length is accomplished, are in a separate cabinet.

The transmitters using grid control have only one power tube and are quite simple in operation but much more critical in adjustment than the first type described. The wiring of this type of transmitter is shown in Fig. 2, the noise filter being shown as separate since it is not contained in the main transmitter cabinet but is in a small cabinet by itself.

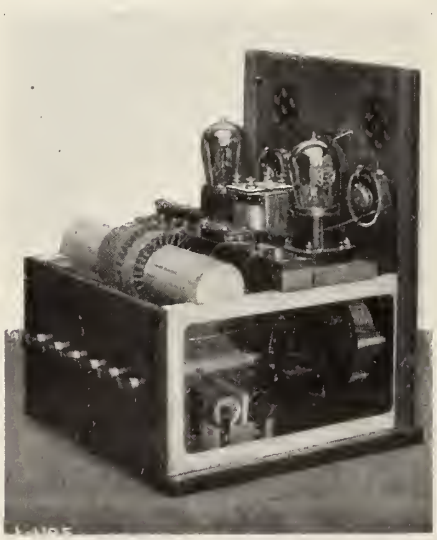


Fig. 4—Rear internal view of receiver

Our receivers are of the type used for straight radio communication. Two three-element vacuum tubes are used ,one for detection and the other for audio frequency amplification.

Fig. 3 and 4 respectively show the front and rear internal views of these receivers, the latter showing the tubes, amplifying transformer, honeycomb inductance coils and variable condensers in their relative positions; Fig. 5 is the wiring diagram.

These receivers have been designed to give the highest efficiency of reception at the one wave length on which all of our guided wave stations operate, namely, 1,570 meters. Within their range, however, they include the wave length of 2,500 meters on which time signals are sent from the United States Weather Bureau through the spark transmitting station at Arlington, Va. Each station receives these signals independently of all other transformer stations on the system, and thus each has an excellent means for the checking and adjustment of the station chronometer.

Each installation consists of a suitable guided wave aerial ,one transmitter and one receiver, with the necessary high voltage generator, storage battery, switches and other parts connected as shown in Fig. 6. These connections are practically the same whichever type of transmitter be used.

These switches are provided, namely:—

No. 1. To ground the aerial when not in use.

No. 2. To select between aerial and telephone lines for operation.

No. 3. The "transmit-receive" switch.

In starting a test or conversation, the operator closes switch No. 2 on one side or the other—which side depending upon whether he is to use the aerial or the telephone lines. When he is using the aerial, he also opens switch No. 1. He then throws switch No. 3 to the left, tunes and listens; or to the right and speaks. In carrying on conversation switch No. 3 is alternately thrown to the right and to the left.

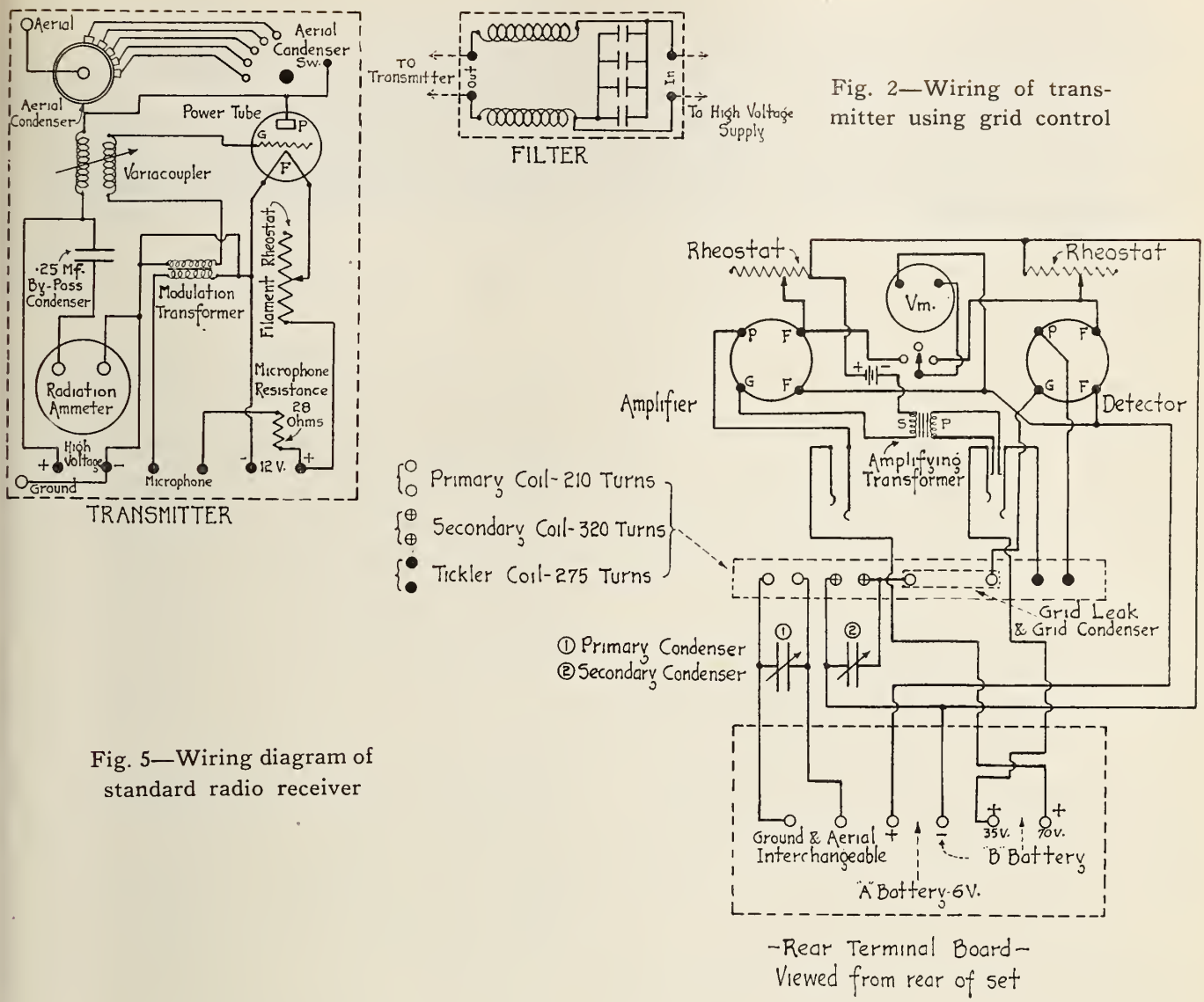


Fig. 2—Wiring of transmitter using grid control

Fig. 5—Wiring diagram of standard radio receiver

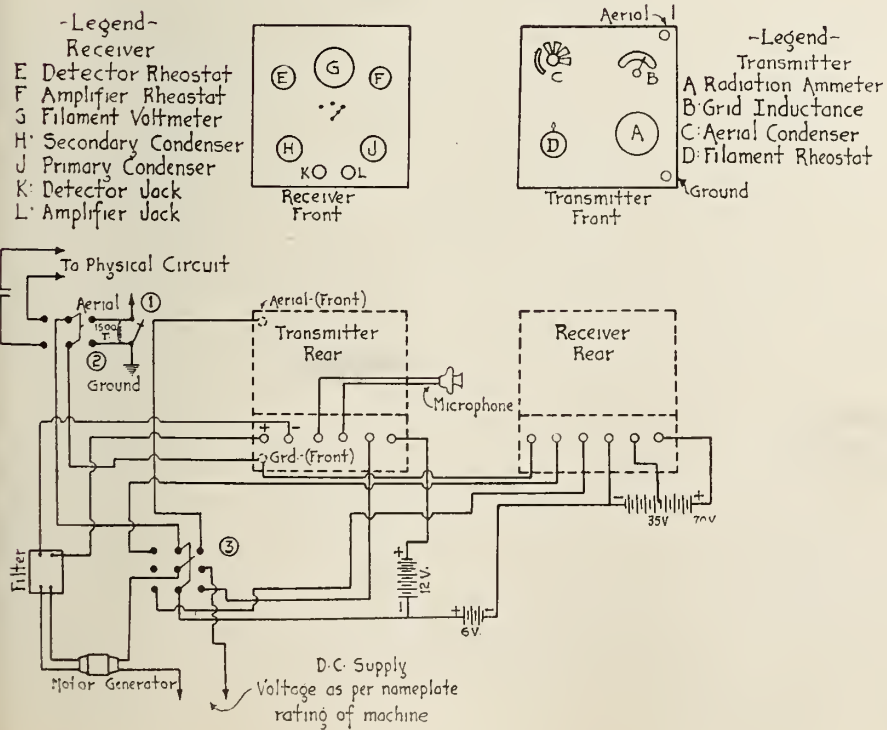


Fig. 6—Layout of connections for typical installation where single tube transmitter and standard receiver are used

When the communication is finished, switch No. 1 is closed and switches No. 2 and No. 3 are left open.

Interruption of Power Supply

Since this radio equipment is installed for use in cases of emergency—for instance, while there is a power interruption—it is essential that the sets be not dependent upon the alternating current supply: they must be run from a source of power which is not subject to interruptions. Storage batteries are therefore used for driving the high voltage generators as well as for lighting the filaments of the power tubes.

Where a transformer station is equipped with a 110 volt storage battery, we obtain the high voltage for the plate circuit of the transmitters by means of a motor generator set, the motor of which operates directly from the battery, the separately excited generator giving from 400—1,000 volts. Such motor generator sets are in use at Niagara, Toronto, Dundas, London, Kent, Essex, Stratford, Preston, and Cooksville.

At several of our stations, however, we have not 110 volt storage batteries and to obtain the high voltage, we use a small dynamotor driven from the transmitter filament battery. In all of these cases we use rectifiers for charging the batteries. The following stations are operated in this way,—St. Thomas, St. Mary's, Kitchener, Guelph, Woodstock, and Brant. Whichever type of machine is installed however, our standard connections, Fig. 6, take care of its operation.

Range and Sensitivity of Equipment

The output power rating of our transmitters is about five watts, and our receivers have only one stage of audio frequency amplification. For straight radio communication on this wave length we would expect the range on a summer day to be about six miles. With these sets, however, operating on the guided radio aerials, we have reached a distance of 195 miles over our power lines in daylight.

Our range would be much greater than this were it not that a very large absorption of power takes place when an attempt is made to pass a transformer station. The condenser bushings of the high tension oil switches apparently form an effective ground for radio frequency currents and we believe that the energy is lost by being led to ground through these condensers. Where a transformer station taps onto a line, much the same effect is noticed.

Interference

We do experience a certain amount of interference, however, when operating on the aerials. Our aerials are close to power lines, and the charging of arresters, flashing of insulators, or any discharges in transformers, motors, or other equipment connected either directly to the high tension lines or to the low tension distribution system from the transformers connected to these lines ,seriously interfere with the operation of the radio equipment. This is to be expected since the surges caused by such flashing are of much the same nature as the radio waves which the receivers are designed to detect.

Guided radio communication is now being given a thorough test on the Niagara System and the equipment installed has fulfilled all requirements in several cases of power and telephone line interruptions on various parts of the system.

Regulating Interference

The following letter has been recently forwarded to all amateur radio-telegraph associations and clubs in the Dominion respecting the forbidding of transmission by amateur radio stations between the hours of 7.30 and 10.30 p.m. It is stated by Mr. E. Hawken, Acting Deputy Minister, that he will be glad to have comments on this matter, as it is necessary to have as representative a volume of opinion as possible when the matter comes up for decision by the Department.

Department of Marine and Fisheries
Ottawa, 1923

Sir:

The regulation recently established by the United States forbidding transmission by amateur radio stations between the hours of 7.30 and 10.30 p.m., has caused urgent representations to be made to this Department for the establishment of a similar rule in Canada.

As you are aware, practically all the radio clubs and associations in the Dominion have already met this demand by voluntarily agreeing to cease operating their transmitters during the evenings.

There would appear to be ,however, in most of our cities, one or two holders of transmitting licenses who are not prepared to abide by these local rules. Such parties have neither the sympathy of the Department nor the reputable amateur, and in order that steps may be taken to curtail their unwelcome activities the Department is disposed to consider the above representations and to issue a regulation specifically forbidding the use of transmitters during certain specified hours. Any party then breaking this regulation will be subject to the penalty prescribed therefor, viz., a fine of $50.00 on summary conviction.

Before the Department commits itself to any definite policy in this matter, we would appreciate an expression of the views of your association in regard to the same. The Department is anxious to afford the amateur every possible latitude, and at the same time protect the broadcast listener. The latter now outnumber the amateurs by at least twenty to one, and it is not unreasonable that they should be afforded the protection they ask for,

A. Johnston,
Deputy Minister.



Uses Billboards to Extend Use of Current

In order to promote the use of Electric current in Vancouver, the British Columbia Electric Railway company has now on display the first of several painted bulletins, 50 feet in length. The board, which is reproduced above, contains only the words, "Life's Greatest Boon—Electric Current. Use it Freely." Covering the board is a night picture of the water front of Vancouver, painted by a local artist. The intention is not so much to sell specific appliances but to enhance the public's appreciation of electric current, thus removing a certain amount of prejudice against its use in a generous way. There would seem to be no reason why this form of advertising to the consumer, could not be used to advantage in other localities.

Westbury Basin Power Rights to be Sold

It is reported that a notice from Quebec states that the Westbury power, owned by the Government, is to be sold by auction. Ratepayers of Sherbrooke are said to have been previously unaware of the fact that that they never owned the Westbury power at all, but only the banks of the river above high-water mark, which are secondary to the actual power, or bed-of-the-river rights themselves.

The following terms have been officially offered by the Government, which has definitely decided that the Westbury power rights will be leased by public auction:

Terms Offered

A fixed annual rental of $600, for a period of 60 years. A supplementary rental of 50 cents per horse-power, based on the installed turbines or other hydraulic motors which might be installed during the term of the lease, according to their maximum return. The development of at least 1,000 horse-power within a period of five years from the date of the auction, and the work will have to be commenced within a period of two years. The power developed from the said rapids cannot be exported out of the province without the consent of the Lieutenant-Governor-in-Council. All power exported, with such consent, will be subjected to a minimum annual rental of 50 cents per horse-power, or to any other dues, period of time and conditions which might be determined and imposed by the Lieutenant-Governor-in-Council. The Crown lands require for the barrage, the hydraulic electric plant or other constructions, and all submerged properties of the Crown, will be subjected to an annual rental of $1 an acre. A deposit of $5,000 will be received as guarantee that the terms of the lease will be fulfilled. The concessionary will have to pay to the Public Streams Commission of Quebec the sum of $1,300 for the use of the plans prepared by the commission. The amount will have to be paid in two equal amounts, the first payment on signing the lease, and the second payment a year later.

60,000 h.p. from Bryson Development

We are officially informed that there is no connection whatever between the Southern Canada Power Company and the newly formed Ottawa & Hull Power Company. Messrs. Nesbitt & Thomson are selling the securities of both companies, but there is no connection between them. The Bryson development will be made by the Ottawa River Power Company, which will be a subsidiary of the Ottawa & Hull Power Company. The development is being studied now with a view of installing sixty or seventy thousand horsepower, and it is likely to be started this year. In the meantime nothing is being done outside of engineering, with the exception of a transmission line which is being built between Ottawa and Bryson in order to provide power for the proposed construction work in the meantime, and to later on transmit the output of the Ottawa River Power Company to the Ottawa & Hull Company.

Cultivate Pep

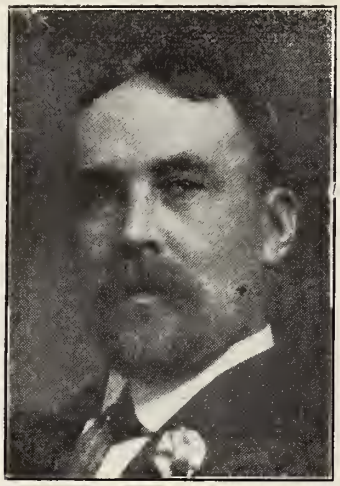
Pep is that indefinable something that puts happiness in the heart, energy in the body, determination in the soul, and indomitable courage in the will. It is "pep" that makes the milkman whistle as he jogs along in the early morning hours; the engineer smile as he throws open the throttle; the merchant and mechanic hurry to their work with a cheery goodby; and the salesman tackle his task with shoulders squared, pride in his heart, and nerves a-tingle with anticipation of new success..

—The Sign Post.

Presentation to A. P. Doddridge

Mr. A. P. Doddridge, former Superintendent of the Light and Power Division of the Q. R. L. H. & P. Co., was given a very pleasant surprise recently when the officers and staff of the company waited on him at his home on Park Ave., and presented him with a beautiful silver tray as a token of the esteem in which he was held by all the members of the staff.

Mr. Doddridge, who had been forty years with the company, resigned recently to give all his time to the Quebec Electric Company, of which concern he is a director and treasurer.



A. P. Doddridge

The presentation was made by Mr. Thos. Kell, the assistant superintendent of the Company, and a bouquet of flowers was presented to Mrs. Doddridge.

Mr. Kell spoke of the cordial relations which had always existed between Mr. Doddridge and the members of the staff during the many years of their association together.

Mr. Doddridge was very much impressed by the demonstration of esteem on the part of his former confreres and responded on behalf of Mrs. Doddridge and himself in a most feeling manner.

Brief remarks were also made by C. J. Pigot, engineer, maintenance of way, by J. Sagala, line foreman, by J. T. Cassels and others.

Letters expressing regret for inability to attend were received from W. J. Lynch, assistant manager of the campany, and from R. A. Wallace, superintendent of the gas division.

Elected President Ottawa & Hull Power Co.

A. J. Nesbitt was elected President of the Ottawa and Hull Power Company at a meeting of the directors. It is understood that the construction of the power development at Bryson, Que., will proceed immediately. This power is to be developed by the Ottawa River Power Company, which is controlled by the Ottawa and Hull Power Company.

E. Tanguay New Manager Quebec Power

Mr Eugene Tanguay, the new general manager of the Quebec Power Company, was formerly manager of the Public Service Corporation.

Mr. Tanguay was educated at the Commercial Academy and Morrin College. He made his debut in the business world with the Jacques Cartier Company, a subsidiary of the American Light and Traction Company. During the twelve years which he spent with this company, Mr. Tanguay was employed in a number of the larger industrial centres of the United States.

When the Jacques Cartier Company was taken over by the Quebec railway. Mr. Tanguay was charged with the reorganization of the Dorchester Electric Company which later became the Public Service Corporation, under the control of the Shawinigan interests. In this capacity he succeeded admirably, and when the Shawinigan interests took over the Q. R. L. H., and P., it was decided to retain Mr. Tanguay as general manager of the new organization.

Three Honest Gentlemen Become Robbers

So it came about that these three honest, respected and much beloved citizens got together and organized the Billville Electric Railway, Light & Power Co. They invested their combined capital and erected a great power plant, strung their wires all over the city and suburbs, laid steel rails where they knew a street car service would benefit the people, and they ran their cars into the suburbs and added greatly to the value of the suburban property. Their cars made it possible for workingmen to live in cottages a long way from their work, instead of hovels down by the railroad tracks.. And in a year or two Billville was a booming, bustling city, with factories and small shops and big wholesale houses that gave thousands employment.

But in the meantime something had happened.

Instead of being honest business men, and respected and honored citizens, John Q. Plodder, Amos K. Figgers and Abinidab J. Smithers were denounced on all sides as dash-blinged, gol-swizzled and dod-gasted robbers, thieves, crooks and swindlers. As individuals they were all right and as Honest as the Day is Long. As owners of the public service corporations that had made Billville a City, they were everything but gentlemen and honest men.—N.E.L.A. Bulletin.

Refinements in Design Make Possible

Large Hydraulic Turbines

By H. G. ACRES, M. E. M. E. I. C.
Chief Hydraulic Engineer, Hydro Electric. Power Commission of Ontario

(Continued from September 15 issue)

Where the head is sufficiently high to require the use of a cast steel scroll case, a serious problem is introduced, having to do with the cantilever strain on the radial joints between the speed-ring and the scroll case. With the ordinary design, efficient bolt distribution is not practicable, and in the shop pressure test, where the scroll is not supported by a surrounding mass of concrete, the bolts are sometimes stressed beyond the elastic limit, with resultant serious leakage. This disability can be largely overcome by casting the speed-ring stay-vanes integral with the scroll sections, but the pouring and annealing of such a casting is most difficult and uncertain of result. The Taylor sectional scroll case is just as effective and largely removes any uncertainty as to the quality of the casting. Taylor's method is to cast the speed-ring stay-vanes integral with a small radial section only of the scroll, and connect later by means of a joint to the main section of the scroll. This joint is so located as to permit of a heavy flange and efficient bolt-spacing, and the castings are of such shape and dimensions that there is every assurance as to their quality after leaving the annealing furnace.

The showing made by the sectional scroll case under shop pressure test indicated that no undue risk would be involved in setting the scroll in the open, with only so much concrete as might be necessary to secure a stable anchorage.

With regard to the pitting and erosion of runners, it may be said that super-turbine development has now reached a stage where this condition is no longer primarily a problem of design, but of economics. In other words if the customer so specifies, the manufacturer can select a specific speed and supply, at a price, a turbine in which the runner will have as long a period of useful life as the other major elements of the installation.

Such a specification on the part of the customer would, of course, involve additional capital expenditure for the generator as well as for the turbine, but, as against this aspect of the situation it must be realized that the modern super-turbine frequency has a capacity which enables it to earn upwards of $2,500 every twenty-four hours. Consequently, the lost revenue charge against runner replacement, in a fully loaded unit, may easily run as high as $25,000.00. If this were necessary every two years, it would be equivalent, on a 6% basis, to a capital charge of $200,000.00. Such being the case, it is evident that the choice of a proper economic specific speed is a matter deserving the most careful and mature consideration, being a factor of at least equal importance with proper gateage, and elevation relative to tailwater.

Efficiency

The overall maximum efficiency of the Queenston units is well beyond 90%, and within their maximum efficiency range they deliver about 32 electrical horsepower to the switchboard for every second-foot of water supplied under 305 feet of net head. Under such conditions a variation of one per cent, one way or the other, on one of these 55,000 h.p. units, would mean either the lack, or the availability, of sufficient power to meet the requirements of an average community of 2,000 population. This statement should serve to emphasize the significance of high efficiency as related to super-turbine practice.

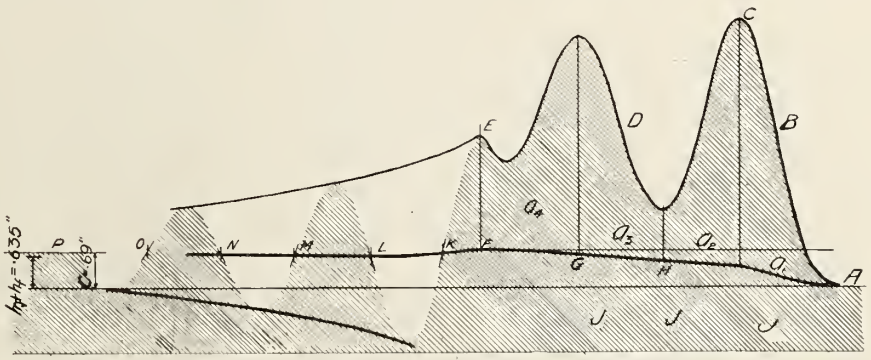


Fig. 4—A typical pressure-time diagram obtained by Gibson process.

The primary factor making for high efficiency is a minimum of obstruction to the direct flow of water from forebay to tail race. This consideration involves water passages of ample section, with changes in direction of flow eliminated wherever possible, and where unavoidable, careful proportioning and transitioning. These requirements constitute the general definition of high efficiency, and are exemplified in the carefully designed annular water passages in the Johnson valve, in the wheel-case, speed-ring, runner and draft-tube of the modern super-turbine, and also in the total elimination of one change in direction of flow entering the wheel-case, by vertically suspending the revolving weight from a Kingsbury type bearing. Secondary, but none the less significant factors, are the elimination of leakage, low power loss in thrust and guide bearings, and expert shop work.

The proper handling and co-relation of these various factors is exemplified in the results illustrated in Figure 1, which shows the efficiency and power-discharge curve for one of the Queenston turbines. The

matters of interest in connection with these curves are as follows:

(1)—The maximum efficiency is 93½%.

(2)—The efficiency at the point of maximum discharge is 88%.

(3)—The turbine has a capacity range of 32,000 to 63,000 horse-power at efficiencies of 90%, or over, and a capacity of 37,000 to 60,000 horse-power at efficiencies of 92% or over.

Figure II illustrates the overall switchboard efficiency curve of the same unit, and indicates a maximum overall efficiency of 91%.

The outstanding fact in connection with these results is that the modern super-turbine is capable of converting into mechanical energy all but 7% of the gross potentiality of the water supplied. Extreme conservation in the fixing of specific speed, and the combined effect of further small refinements in the design of water passages, may possibly raise this efficiency another per cent in the future, and may give the curve a slightly more advantageous shape, but it would really appear that the super-turbine of the present day embodies the ultimate in respect of water economy at the point of best efficiency.

Figure III is an interesting curve representing the first derivative of the power-discharge curve of one of the Queenston turbines.

As its name implies, this curve is derived by plotting the amounts of horse-power per second-foot produced, in various regions of gate opening at and beyond the point of maximum efficiency, by a very small opening movement of the gates. In other words it shows, not the gain, but the rate of gain in power for increasing water input.

It will be seen that when operating at the point of maximum efficiency with a water input of 1,600 second-feet, the gain in power for one additional second-foot supplied is 32 horse-power. On the other hand, at full gate, when the turbine is taking water to the extreme limit of gate-opening, the gain in power for one additional second-foot supplied is only about 10.5 horse-power.

The two extremes above cited serve to illustrate the significance of previous statements made under the head of flow control and also to confirm the truth of the following statement: that under high heads, where the gross potentiality per second-foot of water is correspondingly great, it is in the best interests of economy, as well as safety, to operate normally at the point of best efficiency, and to employ the excess capacity of an over-gated turbine for emergency purposes only, and for routine operation. This statement has an added significance, also when the water supply is artificially stored.

Furthermore, it is obvious that as the point of maximum efficiency is also the point of minimum hydraulic loss, the rate of runner deterioration at this point must also be a minimum. From this point on, the rate of runner deterioration is an accelerating progression, directly related to the degree of over-gate.

The points in favor of gating the super-turbine back to the point of best efficiency are: first, safe and efficient operation, particularly where long pressure conduits are involved; second, economy in the use of water under high heads, where the gross potentiality per second-foot of water is great, and where artificial storage is a factor; and third, on account of runner deterioration, particularly where runner replacement involves a material revenue loss.

The matter of turbine gateage has not, in the past, received the attention it deserves at the hands of the purchaser. It does not particularly interest the manufacturer, and must be covered, if at all by the customer's specifications.

It would also appear that the main factor offsetting the above argument is one of cost, and not of engineering; namely, the additional cost, if any, of providing emergency plant capacity in the form of a seperately installed unit or units, instead or relying on the over-gate capacity of the normal installation.

It may be stated in conclusion that generalizations have probably less weight in hydraulic work than in any other branch of engineering, as nearly every prospective installation is an unique problem in itself, and no class of construction work is less governed by precedent.

Test Methods

The factors entering into a turbine test are forebay and tail-water level measurements, net head measurements, records of gate-opening, and measurements of power flow.

Most of these factors are susceptible of easy and accurate determination by well established methods, but in the case of flow, the immense quantity of water taken by the modern super-turbine introduces an almost unsurmountable problem as regards accurate measurement by ordinary means. It so happens, however, that there has recently been devised a method of flow measurement in closed pressure conduits, which by reason of its accuracy, cheap application, and conformity to an established principle of natural law, entitled it to be classed among the essential advances in the hydraulic art, as related to super-turbine practice.

This method of flow measurement, known as the Gibson Process is based in principle upon Newton's second law of motion, and upon the less generally known theorem of Joukovsky, which is to the effect, that when the velocity of flow in a clossed pressure conduit is retarded, an oscillatory wave is induced, the intensity and amplitude of which is proportional to the degree of retardation, and to the duration of the period over which the retarding influence acts. Briefly, Gibson used the penstock and turbine gates to produce the Joukovsky pressure wave, which he recorded graphically with an apparatus of his own devising, and then reduced the result by the mathematical process of Newton's second law.

The method is therefore almost unique in the field of practical hydraulics, in that it involves no empirical constants whatever, and the mathematical accuracy of the results is limited only by a relatively small instrumental and personal error involved in graphically recording and measuring the pressure wave.

The Gibson process has been fully described in the technical press, and it is not the intention here to cover the details of its theory or application. It may not be amiss, however, to describe briefly, the unique and interesting method of obtaining and using the "pressure-time" diagram which forms the basis of computation.

The recording apparatus consists of a mercury U tube connected to the penstock through a one-quarter inch pipe. The glass leg of this U tube is connected to a camera box containing a lens focusing on a light-proof cylinder, the latter carrying a sensitized film and revolving at constant speed behind an oscillating seconds pendulum. When gate closure occurs, the mercury column in front of the lens rises and falls with the pressure wave, and the record is printed on the revolving film. At the same time, the stem

of the second pendulum, swinging across the face of the lens, records the time period of gate closure on the film, in the form of a vertical black line.

Figure IV illustrates a typical pressure-time diagram thus obtained. The point "A" represents balanced conditions in the system just previous to gate closure. The distance from "A" to the vertical line "EF" represents the full time period of gate closure. The oscillations to the left of the line "EF" are due to the mercury column gradually stabilizing by friction, until at the point "P" static head is registered, with the penstock water column at rest. The vertical distance between the point "A" and the point "P" therefore represents, to the scale of the diagram, the recovery of velocity and friction head. The lines "J" represent the second intervals recorded by the pendulum.

The total area above the base line, and to the point of gate closure at "F," represents a total energy absorption containing three separate elements, velocity head, friction head, and the destroyed momentum of the water column, This latter element being the one required for the application of Newton's second law, it follows that the energy absorption due to

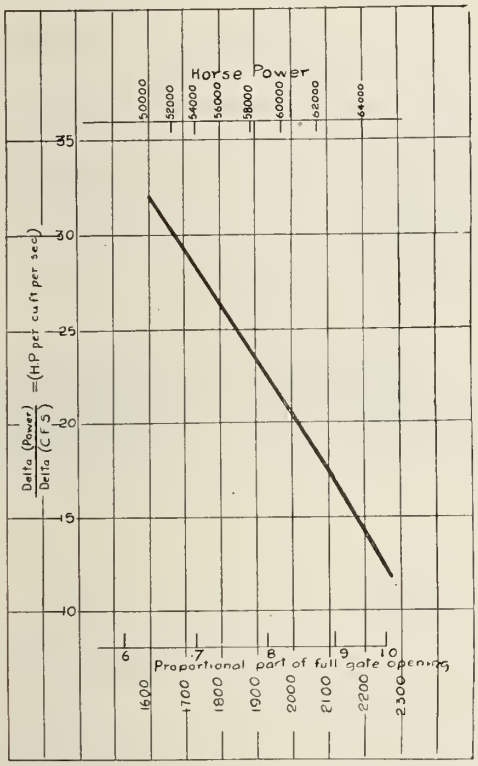


Fig. 5—Gate opening power and gate opening discharge curve for one of the Queenston Units

recovery of velocity and friction head must be segregated.

At the point "A" it is evident that the full value of velocity and friction head is existent, while it is equally obvious that "F," the point of final gate closure, this energy has been fully recovered. The line AHGF, technically known as the "recovery line" divides the total energy area into two parts, the upper part of which A,B,C,D,E,F,G,H, represents the value sought, namely, the destroyed momentum of the water-column. The area below the recovery line of course represents the sum of the other two elements, friction and velocity head. Intermediate points between "A" and "P" on this line are obtainable through the fact that the area generated at the end of any partial period of gate closure is proportional to the amount of flow reduction at that point, and also that the velocity and friction heads still unabsorbed are proportional to the square of the residual flow. The intermediate points "C" and "H" were determined on the basis of these relationships, through the medium of the measured sub-areas A1. A2, A3, and A4.

Figure V illustrates a gate-opening power and a gate-opening-discharge curve for one of the Queenston units. These curves are interesting in that they were compiled on the basis of two simultaneous but entirely independent series of measurements, in different sections of the penstock, by the Gibson process. The round dots on the curve represent the determination of Mr. Gobson himself, with his own assistants, and the triangular dot represent the determinations of the engineers of the Hydro-electric Power Commission. The close agreement of these two series of discharge measurements affords striking evidence of the remarkable consistency and precision of the Gibson method of discharge measurement.

This test, with all the other necessary operations in connection with head and gate-opening measurement, etc., was made complete within about four and one-half hours, and included 28 separate runs at various gate openings, an average of ten minutes per run. The unit itself was out of commerical operation for about one hour altogether, showing clearly the facility and cheapness with which the Gibson test can be carried out.

An interesting feature of these tests manifested itself in an apparent inconsistency in some of the finally computed points for the efficiency curve, which varied for equal power outputs. This trouble was due to a discrepancy in the power readings, which were actually correct in themselves within the error limits of laboratory standards. The reason is that under the Gibson method the velocity measured is that existing at the instant the gates begin to move, and if the speed of the unit is perfectly uniform at this instant, the corresponding power reading will be correct for the measured discharge. If, however, at the instant of the flow measurement, the unit is in process of a speed change even so small as to be unnoticed on the frequency meter or tachometer, an error will be introduced in the electrical power measurement which the Gibson process is sufficiently precise to detect.

The fly-wheel effect of the Queenston generators is 21,000,000 foot-pounds squared. If, at the instant of a flow determination, the speed of the unit is dropping at even so small a rate as one cycle in ten seconds, there is 570 horse-power resistered on the watt-meters which the "wr^2" of the generator is supplying, but not the water as measured .

Conversely, if the speed of the unit is in process of increase at the rate of one cycle in ten seconds, there is 570 h.p. which is not being registered on the watt-meters, but which the water, as measured, is actually supplying, for absorption by the generator "wr^2."

This means that for any one value of discharge there may be any number of watt-meter measurements which may possibly be in error in any amount up to 1,000 horse-power. It is possible that this disability may be overcome by devising some simple means of recording the minute speed change of the unit synchronously with the instant of flow measurement, and thus permit a proper correction to be applied to the power readings.

109 Municipalities Get Hydro Rates Cut

A lowering of rates which affects three cities, 35 towns, 70 villages and one township, was formally announced recently at offices of the Ontario Hydro-electric Commission. The individual reductions range from a maximum of approximately 25 per cent downwards.

The rate reductions come as a result of the terms of the Power Commission Act, under which the Hydro operates. This Act stipulates that electrical energy shall be supplied to municipalities and to the consumers of those municipalities at rates which shall cover all fixed and operating charges. In order that this condition shall be adhered to, the Commission engineers and auditors each year make a careful study of the operating conditions of each municipality. With the assistance of the local Hydro officials the operating costs are properly apportioned, and a decision is arrived at as to whether the rates are sufficient to meet all charges of the service, or as to whether they leave a deficit or a surplus. Adjustments are then made in the rates so that the services will b self-supporting or a little better. This annual survey of the municipal systems has just been completed by the Hydro officials, and the rate revisons announced are its result.

How Electricity Will be Supplied to St. John Exhibition

A report on the cost of rearranging the wiring for the supply of electric current to the Exhibition Association, of St. John, N. B., from the Civic Power Commission has been prepared by the engineer, Barry Wilson. The report says:

It is proposed to connect up to many existing services that supply electric current to the Exhibition building in such a manner as to supply current from three main transformers. In order to do this it will be necessary for the Association to install main secondary feeders.

The cost of making these changes is necessary the first year, and only charges for the installation of three transformers, estimated at $32.50, together with the cost of energy consumed will be carried on in years following.

In past years it has been necessary to install a larger number of transformers at various points on the grounds and these charges are annual.

Three Transformers

It is proposed to install one 50 kilowatt transformer to the left of the southwest wing to supply energy to the front main building; one 35 kilowatt transformer at Wentworth street entrance to supply energy to the agricultural building, cattle shed, show ring, grand stand, office and several outlying buildings and one 50 kilowatt transformer at the west end of the dining hall to supply energy to the rear side of the main building, east wing, dining hall, outside border lights, and dome light, etc.

In following out the above mentioned scheme of distribution, all unsightly poles and wires on the ground will be removed together with the present net work of loose and straggly wires on the outside of the buildings.

In a recent report to the Power Commission the engineer suggested a rate of two cents per kilowatt hour to be measured on the primary side of the transformer, this apparently met with favor.

In measuring the energy consumed on the primary side of the transformer, the necessity of using more than three meters would be eliminated and the engineer suggests that the Association charge the exhibitors, whether on a flat rate per light connected, or as an addition to the exhibitor's fee, in proportion to the floor space allotted to them.

There are Possibilities In Electric Truck Industry

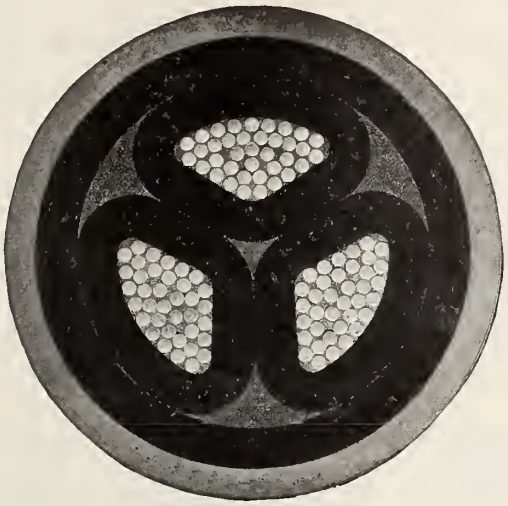
"An industry without the application of proper vision will perish; and if there is any industry which today needs the application of a proper vision to enable it to turn possibilities into actualities it is the electric truck industry."—C. S. Morris

W. J. Hurdman Now Chief Engineer

Mr. W. J. Hurdman, has been appointed chief engineer of the Canadian Independent Telephone Company, vice Dr. Culver. Mr. Hurdman is a graduate of Purdue University.

A Traveling Electric Shop

The Central Illinois Public Service Company has introduced a traveling salesroom for electrical appliances as an aid to its customers in outlying communities where there is no company office. A Ford truck has been equipped for the display of small appliances and makes periodic trips through the company's territory in charge of a captain and three salesmen. The truck is parked on a street corner in a residential section, with the captain remaining in charge. He opens up the folding ironing boards and puts on display the percolators, irons, fans, etc., which are carried. The salesmen start out in different directions, each carrying some appliance, and cover all the houses on their streets. In the meantime the neighborhood children usually gather around the parked car and are asked to carry the news of the Ford's arrival to their parents, and those who are interested in securing appliances make their way to the truck.



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to whom we have supplied a total length of
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British Aluminium Co. Handbook

The British Aluminium Company are distributing a revised edition of their Aluminium Handbook from their Toronto office, 592 King St. West. This company originally published an edition entitled "Aluminium Facts and Figures" which was replete with valuable information, and the present booklet is a development of the earlier publication, bringing the figures and facts to date with numerous additions. The booklet contains a vast quantity of definite information regarding aluminium, in a very small space. It occupies only 60 pages, 4" x 6", convenient pocket size, and is nicely bound in green stiff covers. Any one interested in aluminium will find this book a very useful addition to his library.

Ontario's Telephone Systems

The Ontario Government has issued a report on the Province's telephone systems entitled "An Appendix to the Report of the Ontario Railway and Municipal Board for 1922." Among other interesting information is a list of telephone systems in the province which, in addition to the Bell Telephone Company, includes 689 private or municipally owned telephone systems. Practically all of these, however, are now connected up with the Bell Telephone Company. Figures are also given of the number of telephone stations in the Dominion of Canada, which is placed at 962,445, made up as follows: Bell Telephone Company in Ontario, 304,023, in Quebec, 130,-120; local telephone systems in Ontario and Quebec with which the Bell Telephone Company is connected, 119,439; local systems in Ontario and Quebec, not connected with the Bell, 17,848; the Telephone Company of Prince Edward Island operating in Prince Edward Island, 4,050; the Maritime Telegraph and Telephone Company operating in Nova Scotia, 37,-416; the New Brunswick Telephone Company operating in New Brunswick, 27,954; the Manitoba Government system, 68,420; the Saskatchewan Government system, 97,450; the Alberta Government system, 66,-806; the British Columbia Telephone Company operating in British Columbia 80,552; the Yukon Telephone Syndicate 350; otherwise accounted for, 8,017.

The per cent ratio of telephones to population is greatest in British Columbia with 15.3; Ontario is next with 13.08; then Saskatchewan 12.8; Alberta 11.3; Manitoba 11.05; Yukon 8.4; New Brunswick 7.2; Nova Scotia 7.1; Quebec 6.9; Prince Edward Island 4.5.

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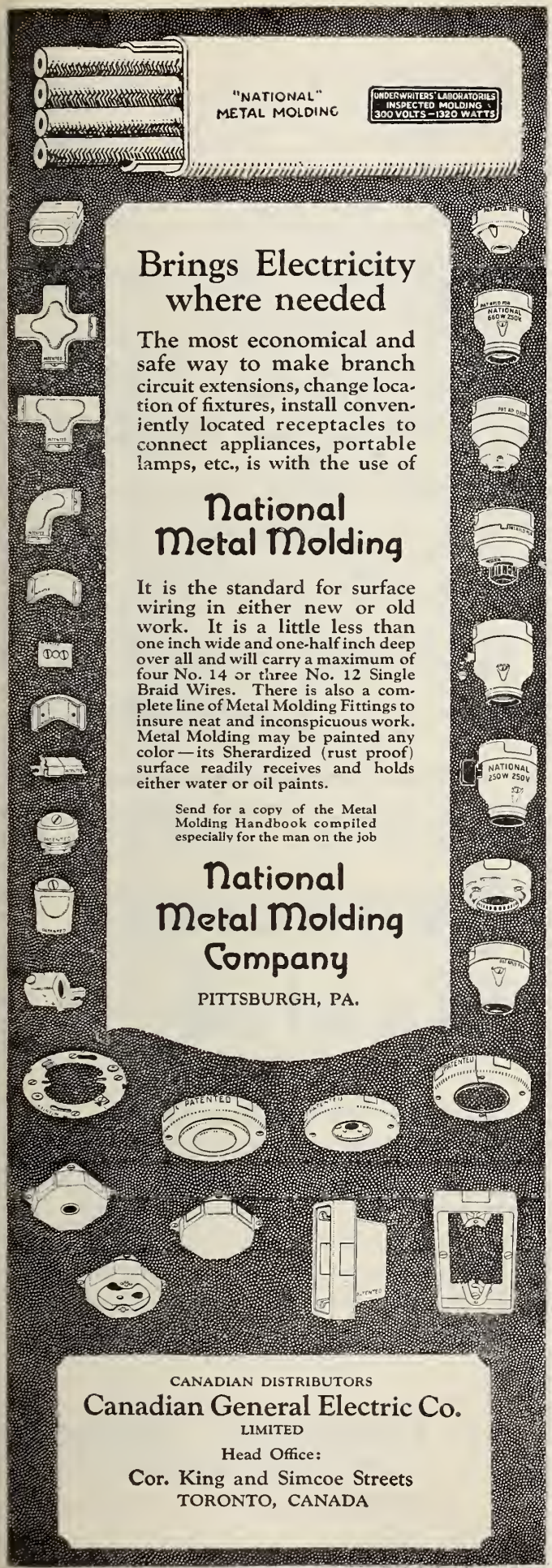
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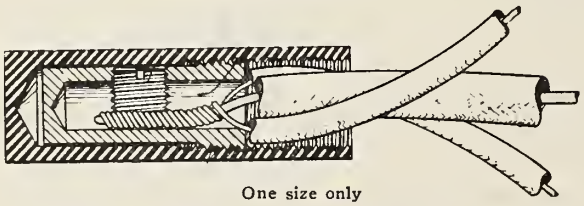
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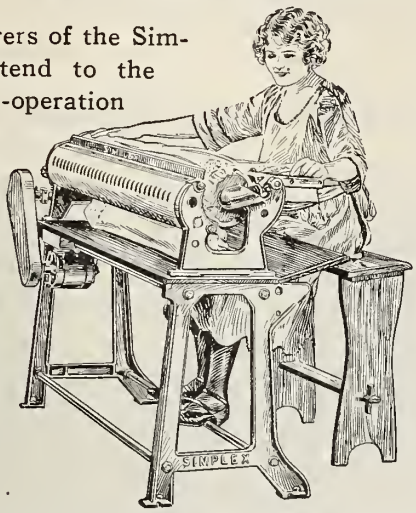
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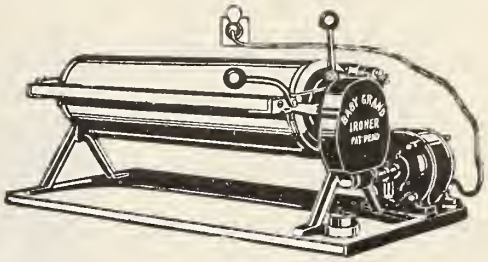
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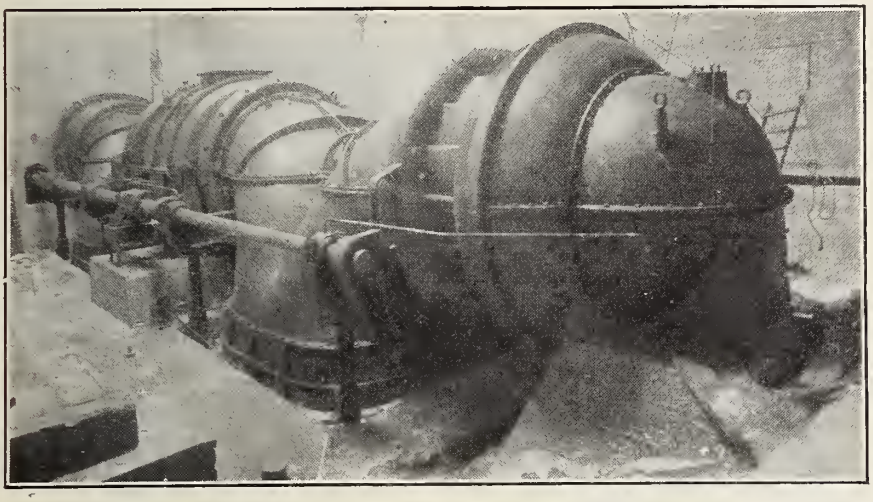
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60 cycle, 3 phase, 220 volt, Second Hand Motors

1	1	1800	T.H.E.
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25 cycle, 3 phase, 550 volt

1	2	710	Century (new)
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25 cycle, 3 phase, 220 volt, Second hand Motors

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15	H. P.	Westinghouse (CCL)	900 r. p. m. Complete
30	H. P.	Crocker Wheeler	900 r. p. m. Complete
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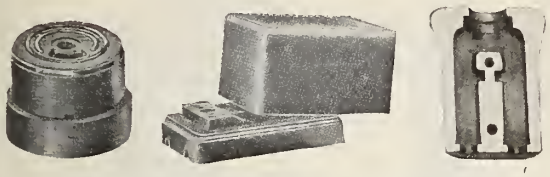
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POLYPHASE MOTORS



are especially adapted to use in remote control installations as they are entirely automatic, requiring nothing but an ordinary knife switch to effect a starting on all sizes.

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We have ready for shipment a counter display stand with a capacity of fourteen (14) lamps and above is shown an actual photograph of this stand. The cards shown are merely a suggestion of the advertising aids rendered by our display stand.

The stand is our own display and is sold exclusively by us. Is made of steel with a cast base and is finished in antique bronze. It is fourteen inches in diameter by twenty-two and a half in height with a base of ten inch diameter. The receptacles used are standard metal sign type finished to match the metal and a slip test socket is fitted in the base.

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Carbon, Graphite, Metal Graphite

For ALL TYPES of Motors and Generators

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with cool weather, longer evenings and clear reception. Your customers are interested in:

Westinghouse Receiving Sets.

Extra headsets—prices very attractive.

Bulbs and Parts.

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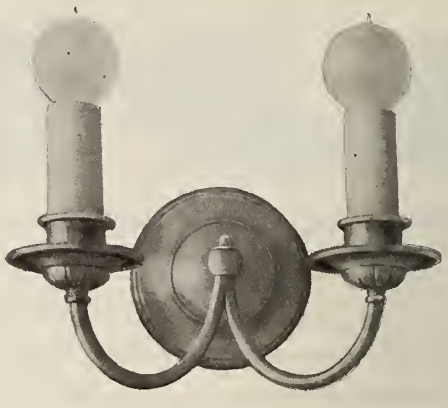
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Tallman Lighting Fixtures

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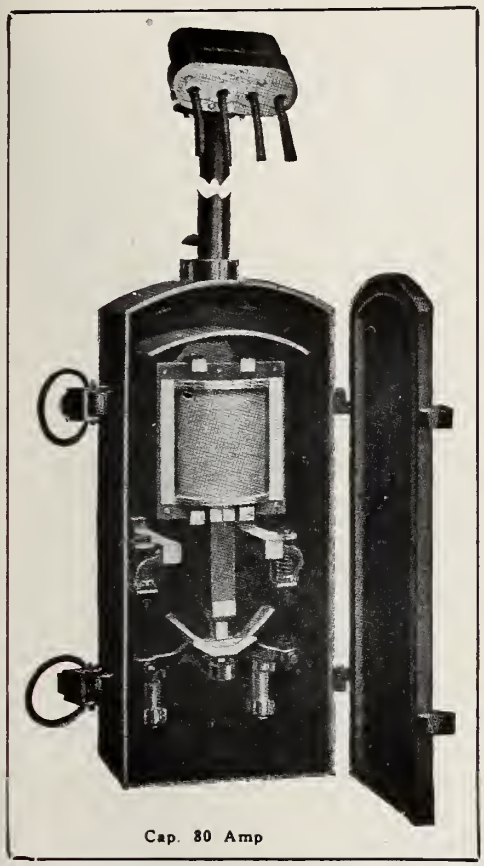


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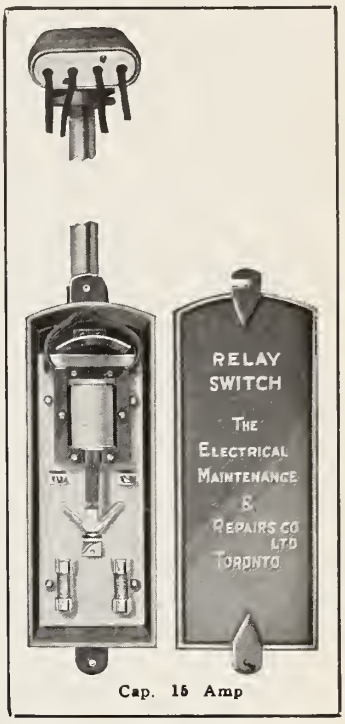
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"Electric Railway" by A Morris Buck, M.E. Published in 1915 by McGraw-Hill Book Company, Inc. 390 pages, illustrated. Price $2.50.

"Elements of Radio Communication," by Ellery W. Stone. A book for the Engineer, Amateur, Student and Layman. 318 pages with 145 illustrations—39 plates. Second edition published March 1923, by D. Van Nostrand Company. Price $2.50.

"Engineering Electricity" by Ralph G. Hudson, S.B., 190 pages Illustrated. Published in 1920 by the John Wiley & Sons, Incorporated. Price $2.00.

"Handbook of Machine Shop Electricity" by C. E. Clewell. Published in 1916 by McGraw-Hill Book Company. 461 pages, illustrated. Price $2.50.

"Principles of Alternating Current Machinery" by Ralph R. Lawrence. Published in 1916 by McGraw-Hill Book Company. 614 pages, illustrated. Price $3.50.

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"The Practical Railway Spiral" by L. C. Jordan, C.E. Published in 1913 by Van Nostrand Company. 155 pages. Price 50c.

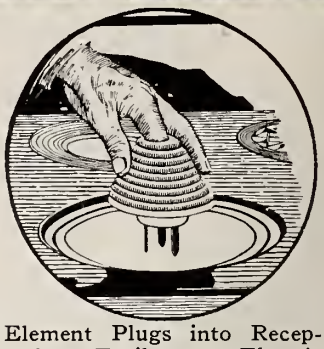
ELECTRICAL NEWS, 347 Adelaide St. W., Toronto, Ontario

Comparisons
boost our sales

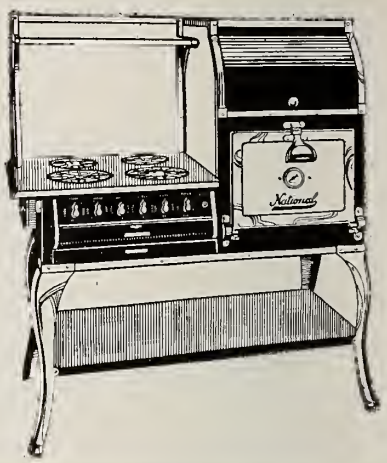
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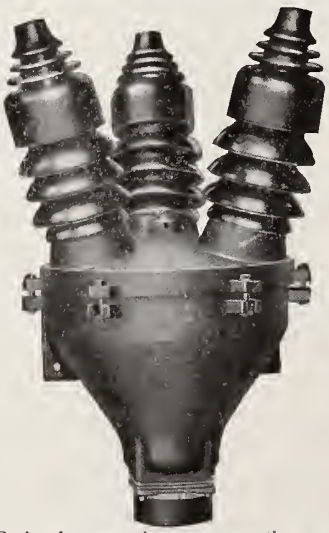


National ELECTRIC RANGE

The National Electric Heating Co. Limited,
Toronto, Montreal, Winnipeg, Vancouver.
Makers of National Electric Ranges, Electric Heaters, Irons, Hot plates, etc.

CABLE TERMINAL DEVICES

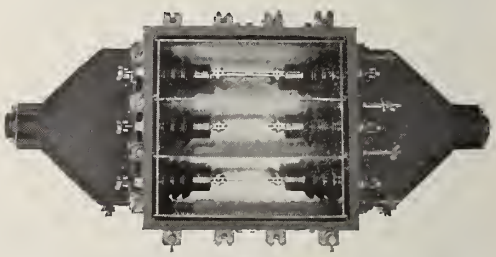
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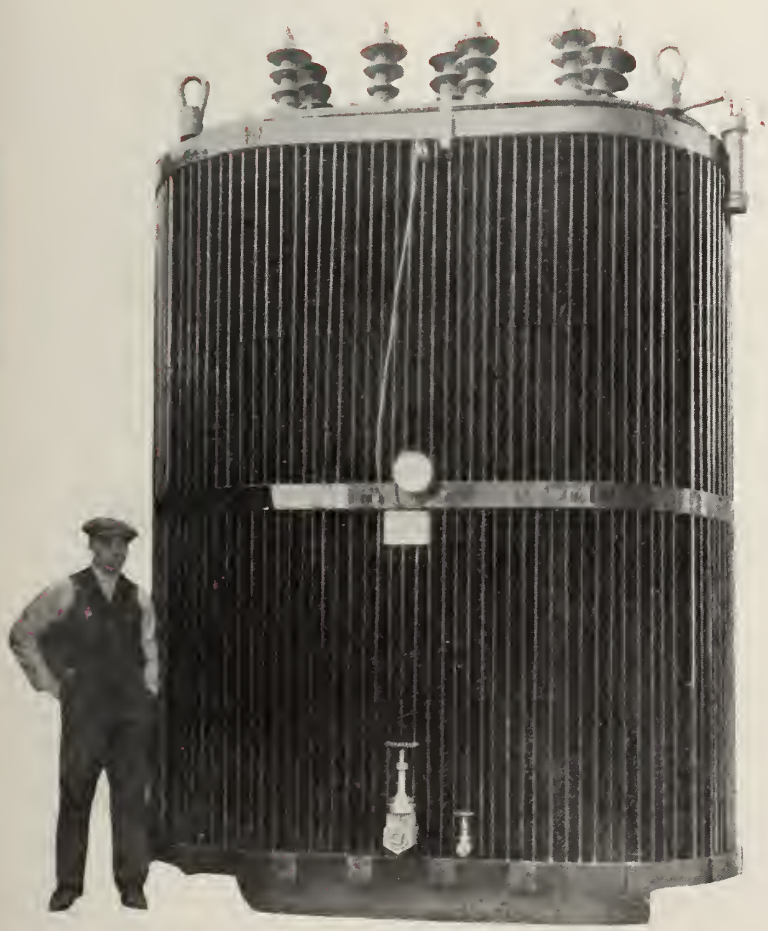
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Vol. XXXII No. 20 Toronto, October 15, 1923

Electrical Engineering Contracting News Merchandising Transportation

Packard

Quality - Service



One of Three for the City of St. John, N. B.

1500 KVA—66000—2310/13860 Volt, Three Phase, 60 Cycle, 40 Degree, Self Cooled Transformers, Insulation Test 165000 Volts

Packard Designs Improve the Lines

What the city of St. John, N.B., demanded was a transformer of maximum overload capacity; that was dependable to the nth degree; and that would prove the most economical in the long run. Naturally, they chose Packards,—three of them, in fact —thus following the example of scores of other critical buyers throughout Canada.

Packard Electric Company Limited

St. Catharines - - Ontario

Room 308-9, 7 Adelaide St. W., Toronto
421 Power Building, Montreal
703 Confederation Life Building, Winnipeg

Agents:

H. M. Hopper, 57-59 Dock St., St. John, N.B.
J. T. Warren, 738—11th St. West, Calgary, Alta.
Scott Foster & Co., 615 Hastings Street West, Vancouver, B.C.

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ELECTRICAL CONDUCTORS
TELEPHONE TELEGRAPH AND POWER CABLES



Paper Insulated Sector L.C. Power Cable

Submarine Telephone Cable

Varnished Fabric Taped and Braided Power Cable

Paper Insulated Armored Power Cable

Paper Insulated L. C. Telephone Cable

Types of Electrical Conductors made in our Montreal Factory where we are staffed and equipped to manufacture Wires and Cables for every electrical need.

Northern Electric Company
LIMITED

MONTREAL TORONTO WINDSOR CALGARY
HALIFAX HAMILTON WINNIPEG EDMONTON
QUEBEC LONDON REGINA VANCOUVER

"Makers of the Nation's Telephones"

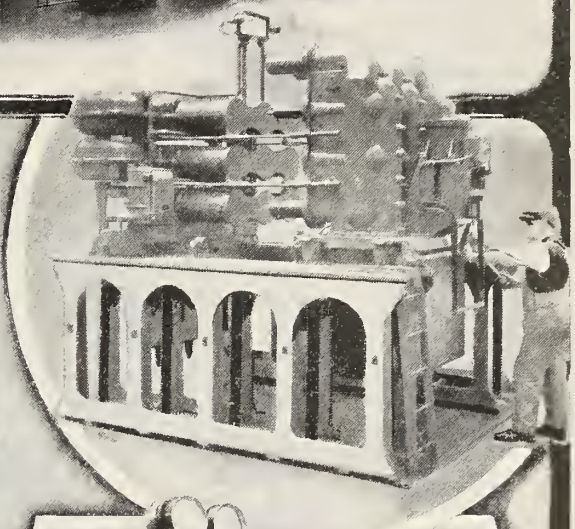
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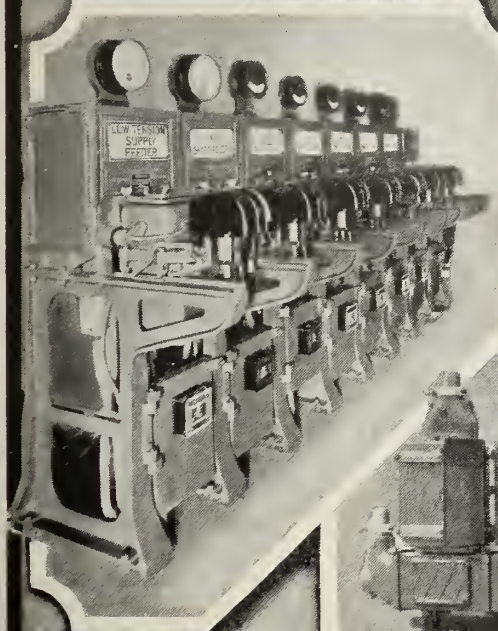
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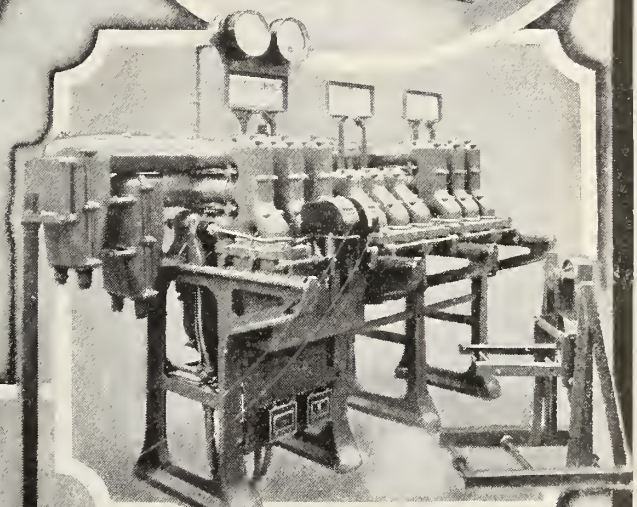
From Power Station Switchboards to Consumer's Accessories

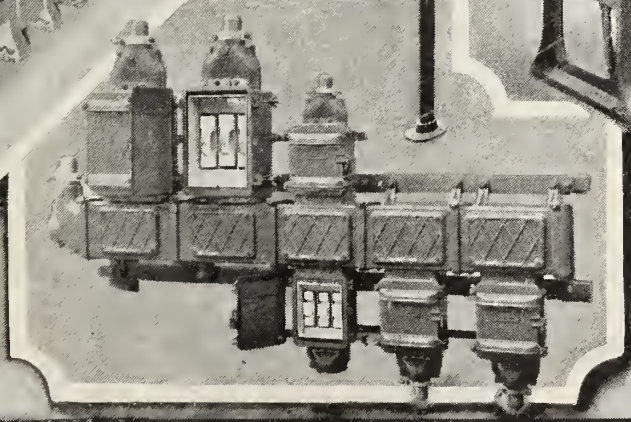


The robust design and metallic enclosure of live parts afford safety and minimize maintenance charges whilst compactness saves building costs and floor space.







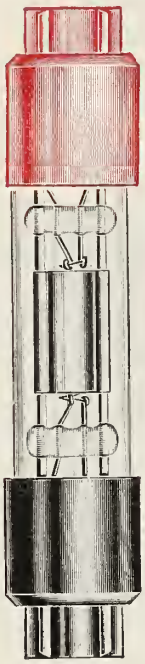




A. REYROLLE & Co LTD.

HEBBURN - ON - TYNE.

The Tube's the Thing!



Full Size

FOR GOOD RADIO RECEPTION
ONLY GOOD TUBES CAN BE USED

Myers Tubes

ARE DESIGNED PURELY FROM THE STANDPOINT OF THEIR REQUIREMENTS AS RADIO EQUIPMENT

This design brings the leads from the grid and the plate of the tube out of opposite ends: in this way the capacity of the tube is reduced and the efficiency greatly increased. In plain words this means that by bringing the leads out of the different ends instead of all in a bunch at one end the large electrical capacity effect so harmful to the proper operation of a Radio Vacuum Tube is eliminated. All elements of the Myers Tube do their work properly and do not interfere with each other.

$5. DETECTOR
AMPLIFIER
OSCILLATOR

Tried and Found to be the Best in Every Country in the World

MYERS DRY BATTERY TUBE
2½ VOLT–¼ AMPERE
FOR OPERATION ON
2 DRY CELLS

Either Type
FIVE DOLLARS
COMPLETE WITH MOUNTING CLIPS READY TO BE MOUNTED ON YOUR SET. NO ADDITIONAL SOCKETS OR EQUIPMENT NECESSARY

MYERS UNIVERSAL TUBE
FOR OPERATION ON EITHER
3 DRY CELLS OR STORAGE BATTERY

MADE IN CANADA

Jobbers
Dealers
Telegraph or
Telephone for
Discounts and
Territory
Still Open

Under Canadian Patents No. 229,182, Patent No. 229,183, Patent No. 229,184, and many other patents issuing and pending.

EXCLUSIVELY BY

F. B. Myers Co. Ltd.
Radio Vacuum Tubes

Your trade will demand Myers tubes—be prepared—put in your stock now.

240 Craig Street West *Telephone Main 7822* **MONTREAL, QUEBEC**

CANADIAN PORCELAIN CO.

LIMITED

HAMILTON - CANADA

Manufacturers of High and Low Tension Porcelain Insulators

Thomson Electric Motors

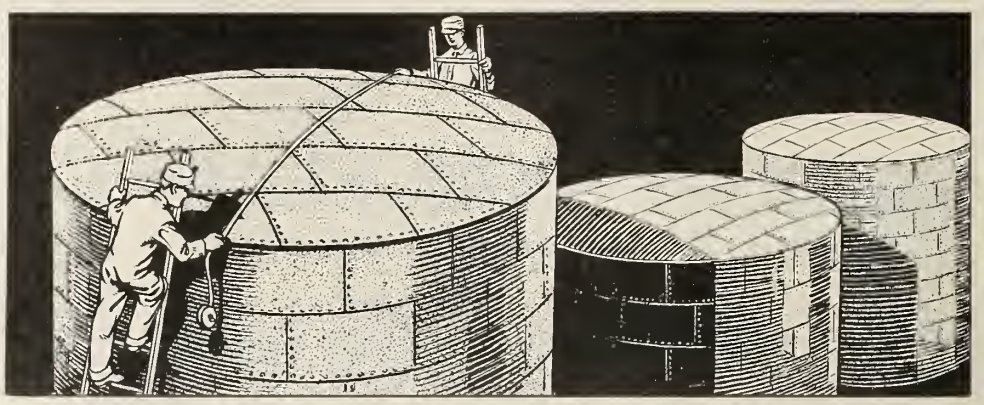
in use in many of the largest manufacturing plants in Canada

are built by

FRED THOMSON CO., LIMITED

ELECTRICAL ENGINEERS

7-13 ST. GENEVIEVE STREET MONTREAL



Could You Determine the Contents of a Tank This Way

TO determine the amount of water in a tank you wouldn't measure the diameter and estimate the height. So far as accuracy is concerned, you might just as well estimate it all.

Why, then, should you measure the actual watt hour consumption of your customers and estimate or neglect their maximum demand.

Each customer's maximum demand determines the proportion of your fixed charges which he should bear—it is your fixed charges which make up by far the greater part of your cost of furnishing current.

A Lincoln Maximum Demand Meter measures demand as accurately as a watt hour meter measures actual consumption. When you base your bills upon **both** readings, no customer is penalized—no customer is unconsciously favored.

Have a talk with our representative when he is next in your territory. If you drop a card saying that you are interested, you will be obligated in no way.

Write for the section (or sections) of the Lincoln Meter catalogue which interests you. SECTION I is a non-technical treatise on why demand should be measured; SECTION II, the technical treatise on demand measurement; SECTION III, Installation; SECTION IV, the Lincoln Graphic Demand Meter; SECTION V, the Lincoln method of Volt-Ampere Demand Measurement (Power Factor recognition); and SECTION VI, the Lincoln Split Core Transformer and Demand Ammeter.

Hand now on left varies with load and shows this load at any time of day.

Hand now on right moves only to right and indicates maximum load since last resetting.

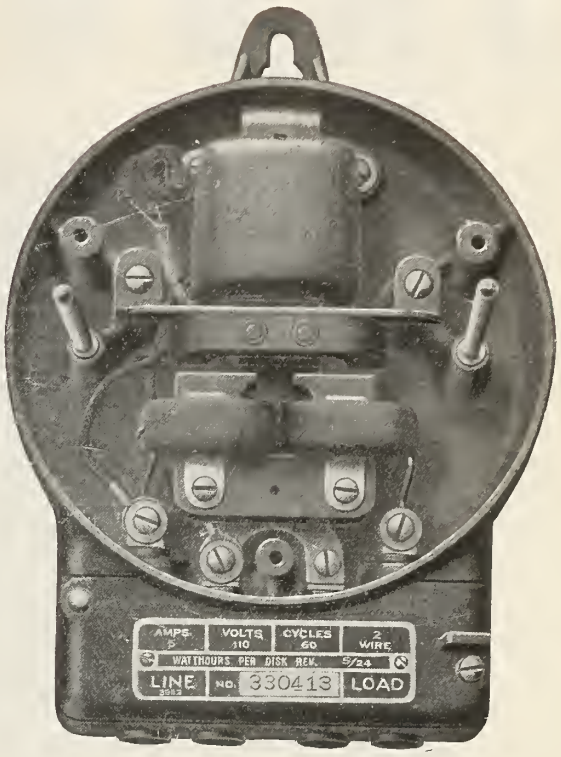


The Lincoln Meter Co., Limited
72-74 Stafford Street, Toronto, Canada
Cable "Meters" Toronto. Phone Adelaide 3969

The Lincoln Demand Meter is available with the Sangamo energy Meter—sold as the Lincoln-Sangamo Demand Energy meter

Lincoln MAXIMUM DEMAND meter

Sangamo Meters Easily Inspected



CENTRAL Station Meter men appreciate the simplicity and ease with which Sangamo Type "H" Meters may be inspected.

Removing the cover exposes all adjustments, bearings, moving system dial mechanism, and permanent magnets. By taking out three screws, the grid, with moving element, damping magnets and both adjustments, may be removed.

SANGAMO



In a moment's time every part of the meter may be laid bare, inspected and re-assembled without disturbing adjustments or electrical connections.

And it can be put together just as easily as it was taken apart, for there is only one way it can be done—the right way

Ask for Bulletin No. 5518 fully describing Type "H" Alternating Current Watthour Meter.

The Sangamo Energy Meter is available with the Lincoln Demand Meter sold as the

Lincoln-Sangamo meter

Sangamo Electric Company of Canada, Limited

2085

Factory: TORONTO Head Sales Office: MONTREAL

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FOR POWER, LIGHT AND TELEPHONE WORK

Incandescent Lamp Cord, Flexible Switchboard Cables, Special Cords and Cables for all kinds of Electrical Work.

Prompt Shipments from Canadian Factory.

BOSTON INSULATED WIRE & CABLE CO., Limited

Canadian Office and Factory, HAMILTON, ONT.

Galvaduct



A Galvaduct Building
The New Knights of Columbus Club House, Montreal, P.Q.
Architect, L. A. Amos, Montreal, Electrical Contractor, J. A. Anderson & Co., Montreal

"GALVADUCT"

The most perfect interior construction conduit on the market.

Recognized as the standard of high quality.

Always specify Galvaduct or Loricated CONDUITS.

"LORICATED"

A high-class interior construction conduit of the enameled type, proof against acid or other corrosive agents.

If your jobber cannot supply you—write us.

CONDUITS COMPANY LIMITED

Head Office and Factory—Toronto

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Limited

NON-METALLIC FLEXIBLE CONDUIT

"INSULADUCT"
AND
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FLEXIBLE STEEL CONDUIT AND ARMORED CONDUCTORS

Also Manufacturers of

FIBRE TWINES and CORDAGE

Office and Works, St. Johns, Que.

Moloney Transformers



Distinguished for their superior performance, economy and reliability

Designed for greater efficiency, and constructed of the finest materials by experts in their line, Moloney Transformers are acknowledged leaders. Moreover they are entirely Canadian built.

We can make prompt delivery on Service Type Transformers from stock.

Write for descriptive bulletins and prices. You will want to keep them on file.



MOLONEY ELECTRIC COMPANY OF CANADA, LTD.

Factory and Head Office: 213-219 Sterling Rd., Toronto, Ont.

Branch Offices: Montreal, Halifax, Winnipeg

Agents: General Supplies Co., Calgary, Alta. **Frank Darling, Vancouver and Victoria, B.C.**





$1.50
List Price

Every Lamp Socket An Aerial With the DUCON---no outside wires necessary

THE Ducon allows a radio receiving set to be connected to any electric light socket, wherever that socket may be. It is simply screwed in like an electric lamp. Although it is connected with the lighting circuit, the Ducon can be handled wihout shock. It is electrically dead. Its terminals may be connected by a wire without the slightest danger.

Practically every electric light wire that enters a house is an ideal aerial. By using the wiring installation of the average house, by means of the Ducon, a large aerial is at once available.

The demand for this wonderful little device is very large. We strongly urge all Electrical Dealers, who are merchandising radio equipment, to place their orders with our nearest sales branch immediately.

"Made in Canada" by

Canadian General Electric Co., Limited

HEAD OFFICE TORONTO

Branch Offices: Halifax, Sydney, St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

At Last

An Indestructible Element for Electric Ranges

OXIDATION—Oxygen destroys metals, and when they are heated the rate of destruction increases. Chemists and scientists have endeavored for years to prevent oxidation. Metals and alloys have been discovered which lessen the action but none which eliminate it.

Meanwhile, the method of isolating metals from oxygen has been practised with excellent results as is illustrated in the manufacture of electric lamps.



Fig. 1



Fig. 2

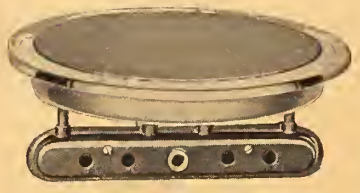


Fig. 3

Exhaustive experiments and tests have been conducted at our Research Laboratories in an endeavor to produce a heating element for electric ranges, which would embody this constuction.

The Hotpoint Indestructible Element is the outcome of these experiments. Fragile, porcelain elements are now no longer necessary on an electric range. The heating element wire, (made of special resistance metal,) is surrounded by an insulating powder, and enclosed in a metal tube or sheath. The element sections are then wound into a circular form, and cast in solid iron, thus forming a complete self-contained unit, which is practically indestructible. The skeleton view figure 1, clearly illustrates the position of the coils embedded in solid cast iron. The Sectional view, figure 2, shows the position of the coils beneath the cast iron surface. Figure 3, shows the complete surface type heating unit, the top of which is as flat and smooth as the lid of an old-time coal range.

Hotpoint sheathed wire elements are the fastest enclosed elements made.



"Made in Canada" by

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited

Hotpoint

Sheathed Wire Elements

The Latest Product of our Research Laboratories

In this construction the unit sections are wound into a form which will give the most even distribution of heat. They are then set into a welded steel frame (see Figure 4) which will neither buckle or warp. The complete unit may be readily removed, and scrubbed if necessary, without the slightest danger of injury to the element itself.

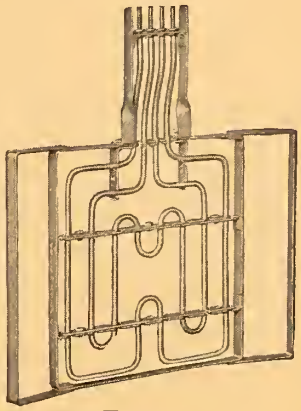


Fig. 4

Figure 5 shows the elements in position in the oven, they are interchangeable, one with the other, and are so constructed that it is impossible to replace them in an incorrect position. All oven parts are easily removable for cleaning, including the oven-rack guides, and the units, leaving a smooth, vitreous, enamelled surface with rounded corners, which is as easy to clean as the top of your piano.

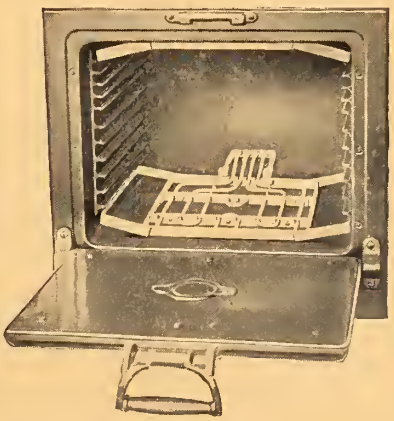


Fig. 5

Owing to the special construction of Hotpoint sheathed wire elements the heat is retained much longer than by the open type.



"Made in Canada" by

HOTPOINT DIVISION

of

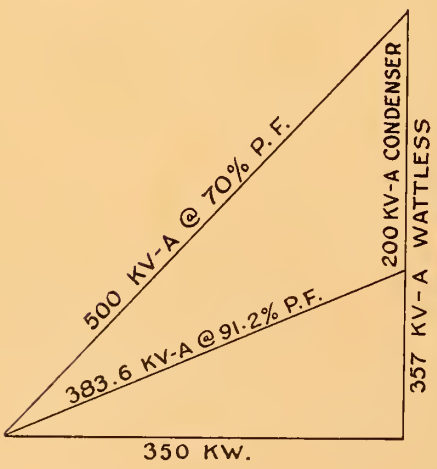
Canadian General Electric Co., Limited

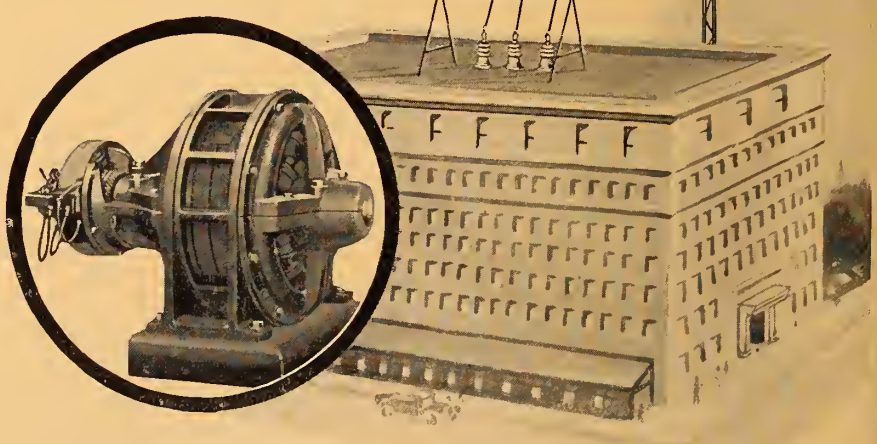


Why Is Low Power Factor Penalized?

A factory load of 350 Kw. at 70% power factor requires station equipment and transmission line capacity, that at 100% power factor would deliver 500 Kw. To compensate the Central Station for the 150 Kw. of plant rendered unavailable for revenue by the low power factor the consumer is charged an amount, and properly so, in excess of his bill for energy used. This charge in excess of the power bill is in the nature of a penalty for low power factor and is a 100% loss to the consumer.

The installation of a C. G. E. Synchronous Condenser of 200 Kv-a. capacity would, as shown in the diagram below, bring the power factor up to above 91%, that is, above the penalty point, would reduce the power bill by the amount of the penalty and in addition improve the voltage regulation and the factory lighting. Any consumer penalized for low power factor may obtain reliable engineering information and data on matters of this nature by referring to our nearest sales branch.





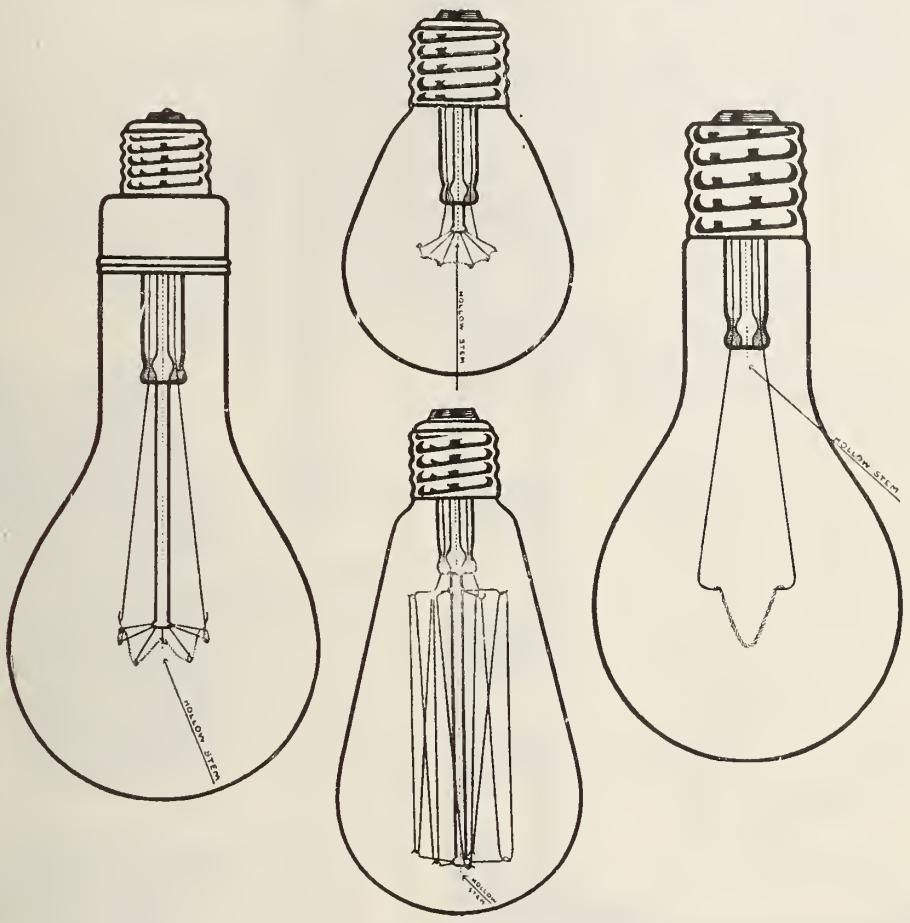
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Canadian General Electric Co., Limited

HEAD OFFICE TORONTO

Branch Offices: Halifax, Sydney, St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

More Profit For You, Mr. Dealer!



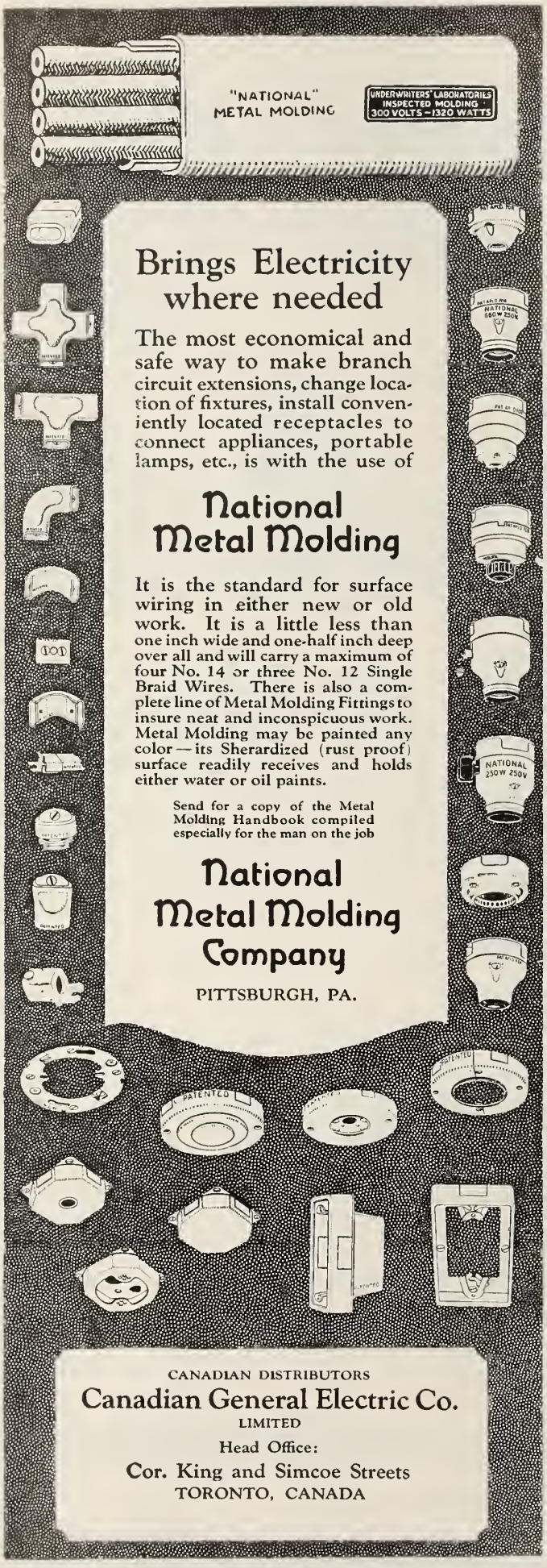
This quartette of DALYTE "Holo-Stem" TIPLESS LAMPS is part of a large family, ranging in size from 5 watt to 1000 watt. The illustrated type of Lamp which is creating increased business for dealers from coast to coast can just as surely do the same for you.

Remember, the DALYTE "Holo-Stem" TIPLESS LAMP is entirely new. It is made only by us at our Guelph factory. The tipless lamp will eliminate vexatious claims from your customers re broken tips.

We have a distributor in your district to give you first class service.

DALYTE ELECTRIC LTD. GUELPH, ONT.

Manufacturers



Brings Electricity where needed

The most economical and safe way to make branch circuit extensions, change location of fixtures, install conveniently located receptacles to connect appliances, portable lamps, etc., is with the use of

National Metal Molding

It is the standard for surface wiring in either new or old work. It is a little less than one inch wide and one-half inch deep over all and will carry a maximum of four No. 14 or three No. 12 Single Braid Wires. There is also a complete line of Metal Molding Fittings to insure neat and inconspicuous work. Metal Molding may be painted any color—its Sherardized (rust proof) surface readily receives and holds either water or oil paints.

Send for a copy of the Metal Molding Handbook compiled especially for the man on the job

National Metal Molding Company

PITTSBURGH, PA.

CANADIAN DISTRIBUTORS

Canadian General Electric Co.

LIMITED

Head Office:

Cor. King and Simcoe Streets

TORONTO, CANADA

"Pigs"

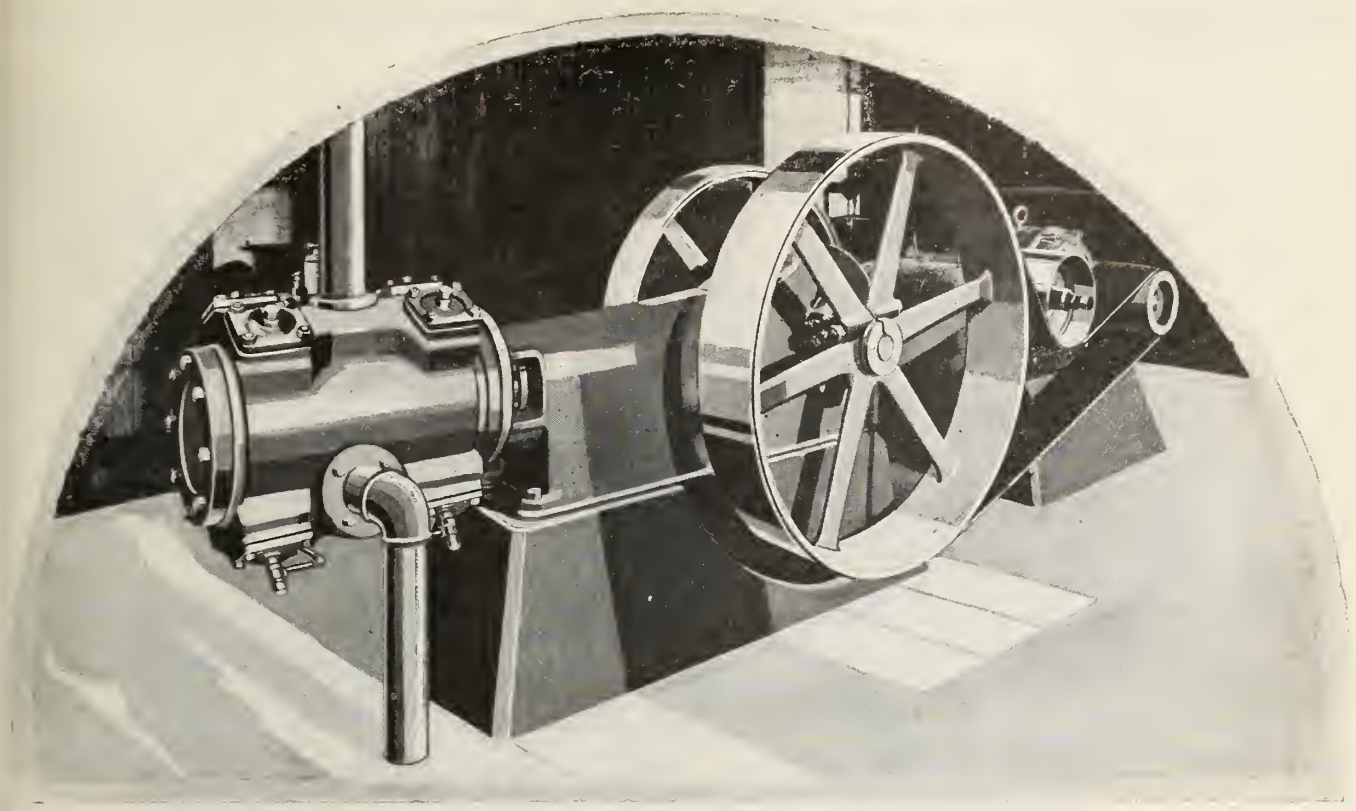
—that's what they call Marshall's Live Line shields —Just pigs!

But gosh, what a comfort they are to the Man-on-the-pole, absolute protection against 20,000 volts. They save time, money—and regret!



Linemen Protector Company

850 Penobscot Building
Detroit, Mich.



Where Can We Use More Air?

Every day in practically every industry men are asking this question because they know that the use of more air means less manual labor and reduced production costs.

Air hoists and air operated tools such as riveters, chippers, grinders, clay diggers, paving breakers, etc., have ideally demonstrated their superiority, power and flexibility.

The advantage of air over steam for operating rock drills, pumps, feed cylinders or other reciprocating mechanisms is well recognized.

The advantage of the portable sand blast and paint spray were instantly recognized and adopted.

The raising, agitation, aeration and transportation of liquids with compressed air is being used wherever possible.

A jet of air pumps water, protects dams against ice pressure; cleans roads before asphalting or oiling; keeps machinery, generators or motors, ceilings or walls, spick and span and has scores of other applications.

So the "Story of Air and Its Uses" grows ever bigger, for each day men see the advantages of its application, and every day the compressor which supplies the air assumes greater importance.

Men who know specify "Ingersoll-Rand," and where only a limited supply is needed they choose Class "ER" or "FR" compressors. Their simplicity appeals to the operating engineer and their efficient performance is revealed in each month's power bill.

Consult our engineers for suggestions about the use of air and let us send you descriptive bulletins. Bulletin K-311 describes "ER" Belt-Driven Compressors and Bulletin K-312 "ER" Steam-Driven machines.

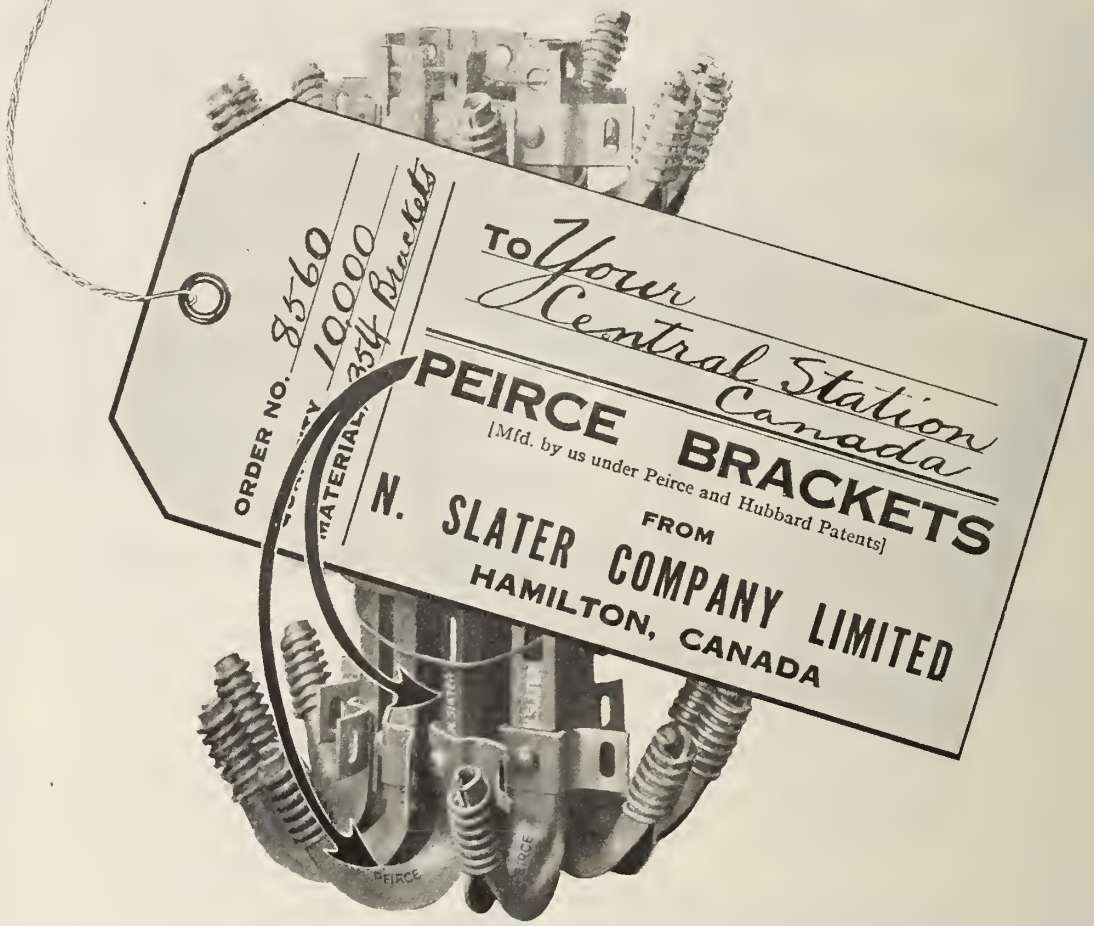
Canadian Ingersoll-Rand Company, Limited

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The Peirce



YOUR SAFEGUARD—

Just like Sterling Silver—every piece of Peirce Pole line hardware bears the mark of its maker. Sterling quality has a special significance not because of the marks, but because of the quality in the article that gives the marks a special meaning. We are prepared to stand behind the thoroughly careful manufacture of every piece of the Peirce pole line hardware.

The marks of the Peirce and N. Slater Company, Limited go on after thorough inspection has shown it worthy to bear the name. Then—and only then—is it hot dip galvanized to withstand the four (or even ten) immersion test, equal to thirty-five to fifty years atmospheric exposure.

Be sure to ask your jobber for

The Peirce

N. SLATER COMPANY, LIMITED

HAMILTON **CANADA**



"Twas Ever Thus"

Busier than a one armed paper hanger, hardly time to eat and sleep, but never enough money on hand to meet the bills and drafts that flow in from all corners. The above picture tells the same old story. The greed for VOLUME and the lack of attention to the business end of the business. No wonder 97% of electrical men fail to make good.

Here's The Trouble

In the first place few Electrical dealers keep a record of their Fixed Charges (Overhead Expense) and therefore have no definite policy of making their charges and tendering on jobs. It's a hit and a miss game with many and mostly it'smiss with the result that about 80% of the Electrical work in Canada to-day is being done at cost or less.

The Solution

To operate an electrical business succesfully you must sell your goods and services, whether Contract, Time and Material or Store sales at prices that will cover your Fixed charges plus a reasonable profit. There's nothing mysterious about it. It's just common sense but the dealer has too many other things to attend to, to attempt to keep accurate track of over 2000 items in every day use and the Henderson Pricing system is an outgrowth of this condition.

We Guarantee Your Profits

No matter where you are located—if your business is in the basement or on the front street we will undertake to guarantee you a profit on every article passing through your hands. We are doing it for others and can do it for you. Is it not worth investigating?

Cut this out and mail today ➘

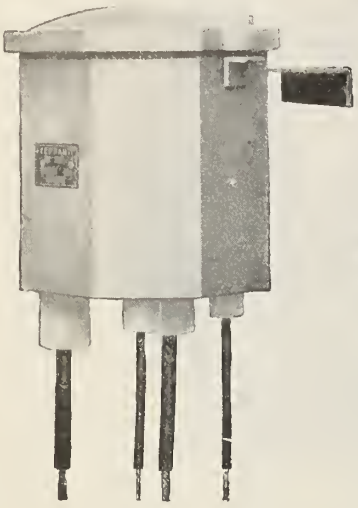
Henderson Business Service Ltd.
Box 123
Brantford - - Ontario

Henderson Business Service Ltd., Box 123,
Brantford, Ont.
Send us full particulars of your service
Name .....
Address .....

FERRANTI

Transformers

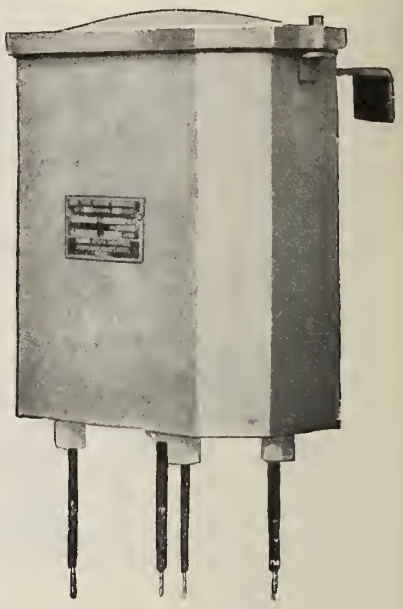
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Type "GW"

TYPE "GW" Cross-Arm Mounting Weatherproof. Circuit up to 6600 volts. Rating 50 Volt Amperes.

TYPE "PW" Potential Transformer, Pole Mounting Weatherproof, Single, or Three Phase for circuits up to 6600 Volts.



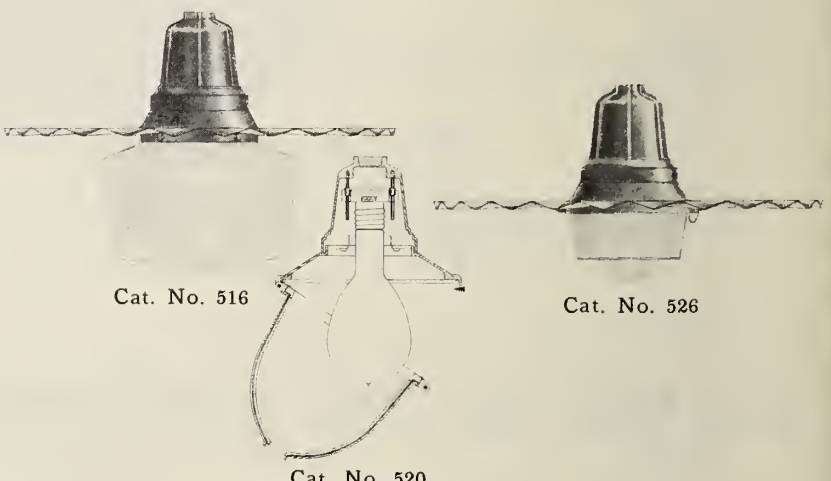
Type "PW"

FERRANTI METER & TRANSFORMER MFG. CO. LIMITED

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Northwestern Engineering & Supply Co. Calgary Northern Ontario J. P. Bartleman, Timmins

A group of Multiple Fixtures containing complete interchangeable parts. May be equipped with Mogul or Medium base — adjustable or rigid sockets. Takes any 6 or 8″ globe or Holophane refractor.



Cat. No. 516

Cat. No. 526

Cat. No. 520

56 Different Fixtures of this type

Winter Joyner Company Ltd.

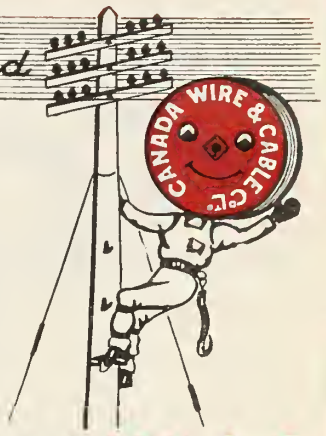
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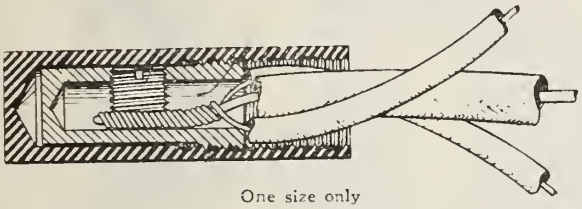


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This handy little book is full of valuable information for the electrical engineer, contractor, construction man, repair man, etc., and a copy will be gladly sent on application to our nearest branch. Write or phone for it today.

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Insulated Wire Connector



One size only

Takes any fixture condition

Approved by Hydro and Underwriters' Laboratories

Notice The Lighting Equipment Everywhere You Go
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No Paste or Solder Tape or Torch
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Notice The Lighting Equipment Everywhere You Go

Use the Marr Connector on fixtures everywhere then notice the lighting equipment (It will stand a stare.)

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Once Used Sure Repeater.

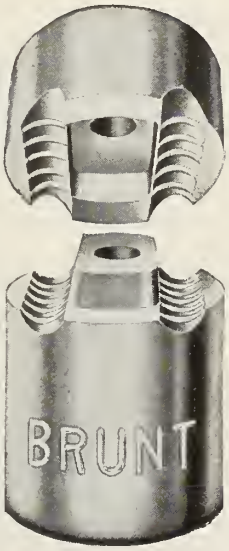
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Sole Manufacturer

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Manufacturers of Electrical Porcelain Specialties. Also specialize in the manufacture of heater bricks for electric ranges.

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Approved by the Hydro-Electric Commission of Ontario
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Made in Canada Conduit

Electrical Wiring Made Safe

For All Electrical Installations

Manufactured by
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The following Books are Offered Subject to Previous Sale:

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"Direct-Acting Steam Pumps" by Frank F. Nickel. Published in 1915 by McGraw-Hill Book Company. 258 pages illustrated. Price $2.00.

"Electric Railway" by A Morris Buck, M.E. Published in 1915 by McGraw-Hill Book Company, Inc. 390 pages, illustrated. Price $2.50.

"Elements of Radio Communication," by Ellery W. Stone. A book for the Engineer, Amateur, Student and Layman. 318 pages with 145 illustrations—39 plates. Second edition published March 1923, by D. Van Nostrand Company. Price $2.50.

"Engineering Electricity" by Ralph G. Hudson, S.B., 190 pages Illustrated. Published in 1920 by the John Wiley & Sons, Incorporated. Price $2.00.

"Handbook of Machine Shop Electricity" by C. E. Clewell. Published in 1916 by McGraw-Hill Book Company. 461 pages, illustrated. Price $2.50.

"Principles of Alternating Current Machinery" by Ralph R. Lawrence. Published in 1916 by McGraw-Hill Book Company. 614 pages, illustrated. Price $3.50.

"Radiodynamics"—The Wireless Control of Torpedoes and Other Mechanisms, by B. F. Miessner. Published in 1916 by D Van Nostrand Company. 206 pages, 112 illustrations. Price. $1.50.

"Telegraph Practice, a Study of Comparative Method" by John Lee, M.A. Pubished in 1917 by Longmans-Greene & Co. 102 pages. Price 75c.

"Telegraphy"—A Detailed Exposition of the Telegraph System of the British Post Office, by T. E. Herbert, A.M. Inst., E.E. Third edition. Published in 1916 by Whittaker & Company. 985 pages, 630 illustrations. Price $1.50.

"Theory and Calculation of Transient Electric Phenomena and Oscillations," by Charles Proteus Steinmetz. Third edition, revised and enlarged. Published in 1920 by McGraw-Hill Book Co., Incorporated. 696 pages, illustrated. Price $6.00.

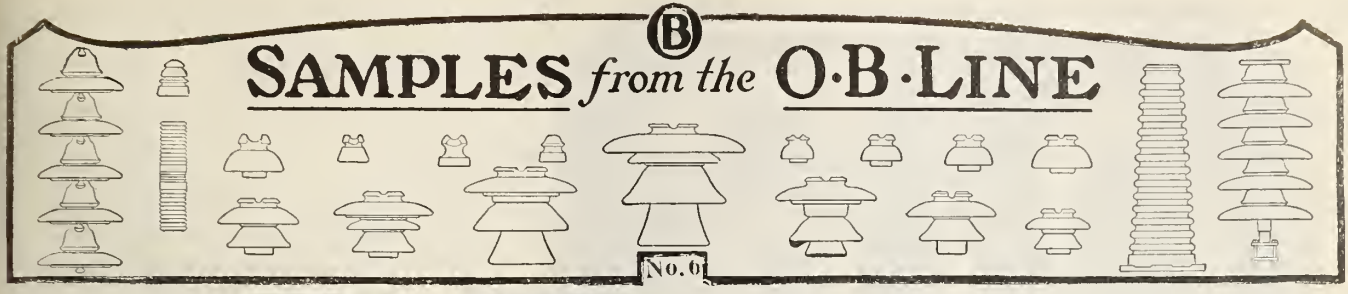
"Testing of Electrical Machinery," for non-electrical students, by J. H. Morecroft. Fourth edition, revised and enlarged. Published by D. Van Nostrand Company, 1921. 220 pages, 111 illustrations. Price $3.00.

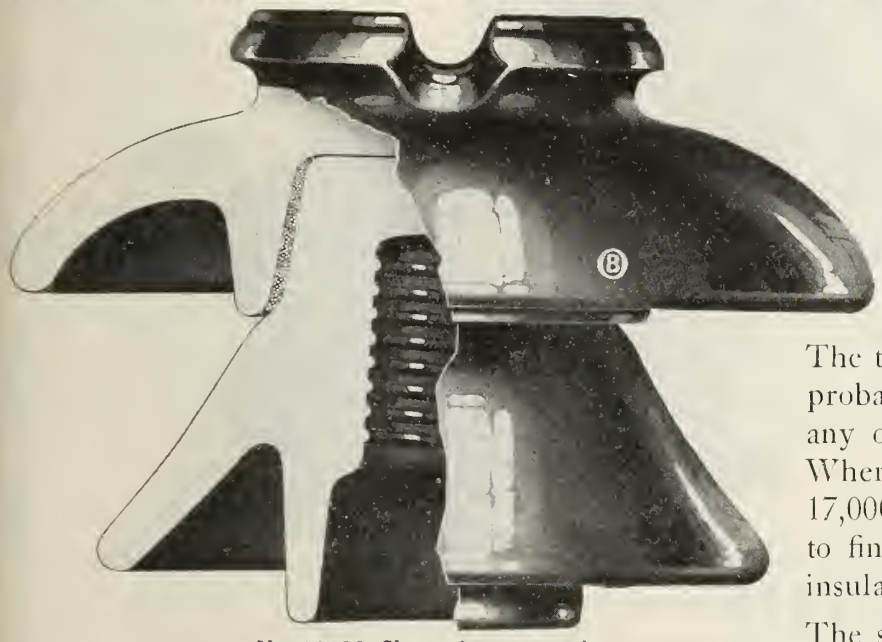
"The Dynamo" (2 volume), by Hawkins & Wallis. Published in 1909 by Whittaker & Company. Price $3.00.

"The Essentials of Transformer Practice". A treatment of the theory, design and operation of the transformer from a practical engineering viewpoint, prepared primarily for the engineering student and the designing and operating engineer, by Emerson G. Reed. Just published by D. Van Nostrand Company, 265 pages, illustrated. Price $3.00.

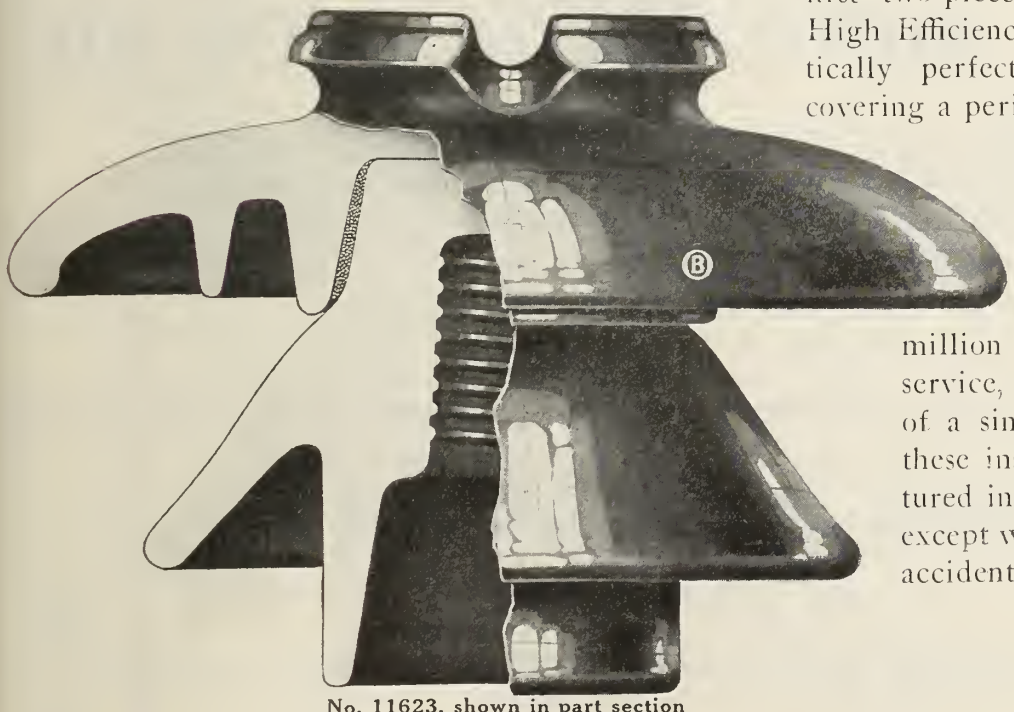
"The Practical Railway Spiral" by L. C. Jordan, C.E. Published in 1913 by Van Nostrand Company. 155 pages. Price 50c.

ELECTRICAL NEWS, 347 Adelaide St. W., Toronto, Ontario





No. 11622, Shown in part section



No. 11623, shown in part section

Two Familiar Faces

The two insulators illustrated here are probably more widely used than any other two-piece insulators made. Wherever you see a line carrying from 17,000 to 45,000 volts, you are likely to find one or the other of these two insulators carrying the wires.

The smaller unit, No. 11622, was the first two-piece member of the O-B High Efficiency Line. It has a practically perfect field service record covering a period of more than eleven years. The larger No. 11623, has a record just as good, and almost as long.

With more than a million of these insulators in service, we have never heard of a single case where one of these insulators has been punctured in service, or has cracked except when broken by exterior accidental means.

117

Dominion Insulator & Mfg. Co. Limited

(Manufacturing Ohio Brass Company Products in Canada)

Niagara Falls - - - - - - Ontario



This Motor does more *because* of air

THE more load a motor carries, the more heat will be generated in its windings. Excessive heat deteriorates and destroys the insulation—shortens the life of the motor.

Therefore, more effective means of air-cooling the motor windings adds to its life and to the load it can carry.

That, in a nut-shell, is the idea behind the new Wagner Pow-R-full Motor — the motor that is more efficient, gives more service—because the windings get more air.

Based on exhaustive study of motor installation, operation and maintenance, the design of the Wagner Pow-R-full motor not only provides for better cooling but for better service from every practical standpoint.

Write for Bulletin 13213

WAGNER ELECTRIC MFG. COMPANY OF CANADA, LIMITED
Power Bldg., Montreal 217 Dundas St., E., Toronto

Wagner Quality **Pow-R-full Motor**

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We negotiate sale and purchase of developed and undeveloped water-powers.
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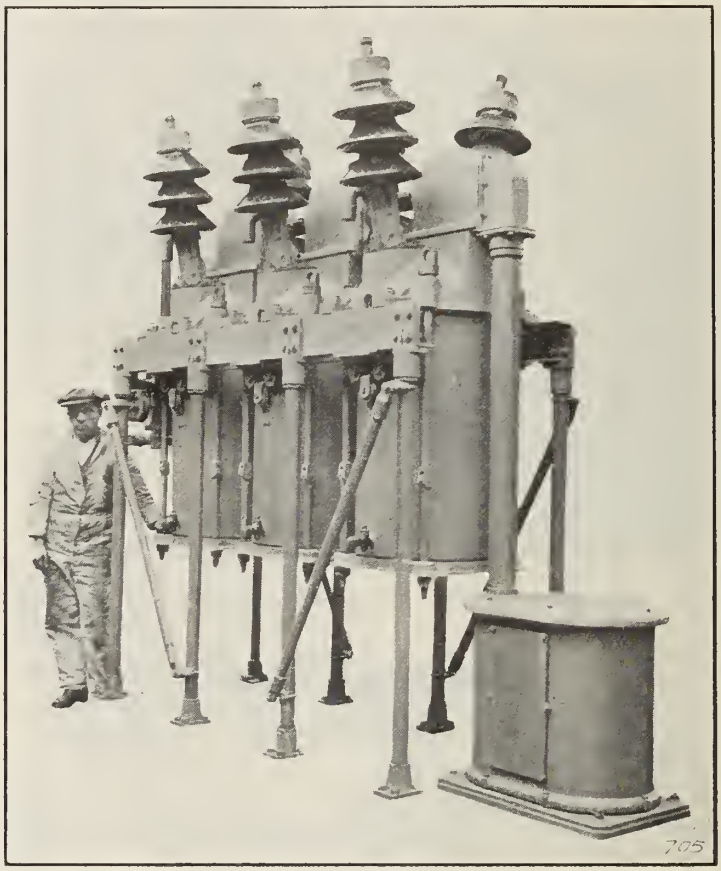
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Expert in Patents, Trade Marks, Designs Copyrights and Infringements. 30 Years' Experience in Patents and Practical Engineering
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This Space is Available

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Write to-day!

Electrical News
349 Adelaide Street West, Toronto



26,400 Volt Outdoor Oil Circuit Breaker

If you require equipment of a **robust** and **reliable** design and first class workmanship, enquiries forwarded to

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will receive prompt attention. Equipment ordered will be to your satisfaction.

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Know the best Brush *for* each Generator or Motor

THE brushes must be *exactly right* or the machine cannot perform with its proper efficiency. The commutator should be silent, smooth-running and cool—always.

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And Columbia Data Sheet Service is at your command whether you have one brush equipped machine or many. Avail yourself of it.

CANADIAN NATIONAL CARBON CO.
Limited
MONTREAL TORONTO WINNIPEG

C N C
Look for this Mark on your Brushes

MG7

NUMBER 7

This is the seventh of a series of ten advertisements

The Line that R. and I. E. Co. Builds!

This is the — Base—Steel Channel

That supports the — R. & I. E. Interchangeable Insulator Units with Forged Steel Pins and Pressed Steel Caps. No clamps, no screws

That carries the — Choke Coil — triangular type

and the — Limiting Resistance in the ground circuit. Auxiliary Gap, shunting resistance

That makes up the — R. & I. E. Arresters provide for an efficient obstruction and a point of relief at the same place. They are low in first cost, easy to install and require a minimum amount of attention

Interchangeable Unit Horn Gap Lightning Arrester that R. and I. E. Co. Builds

R. & I. E. Interchangeable Insulator Unit Equipment for outdoor service includes Bus Supports, Disconnecting Switches, Air Break Horn Gap Switches, Choke Coils, Fuse Holders, Lightning Arresters, Substation Combinations and Outdoor Steel Substations

Manufactured by
Railway and Industrial Engineering Co.
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7



Cat. No. 5056

A New Heavy Design

which is proving to be popular

for 300 W or 500 W Lamps

Supplied with either Holophane Refractor or Globe.

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We also solicit your enquiries for the products of

Weston Electrical Instrument Co.
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Successors to
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of your equipment by increased efficiency and neater appearance.

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MARSH ALLOYS

Stands the Heat



It won't scale off. It stands high temperatures better than any other alloy known. It is made in all sizes for Electrical Heating devices. Can you use an element like this?

Write for full particulars.

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Canadian Armature Works

St. Catharines, Ontario, Canada

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Electrical Repairs **Power Installations**

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Motors **Commutators** **Transformers**

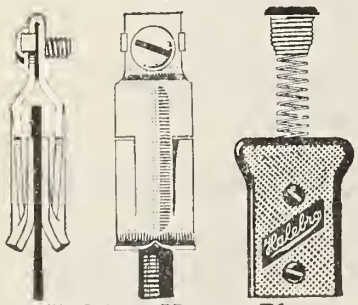
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Armatures rewound, any type of coil manufactured

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Improved Halebro Heater Plug



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These clips are made of selected spring brass, designed to fit perfectly on either round or flat terminals. THEY WILL NOT ARC.

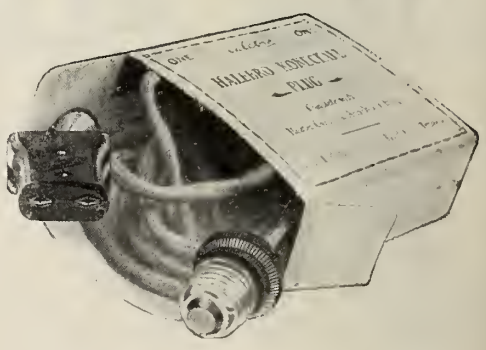
This feature assures long life and satisfaction.

Hydro Electric approval No. 406

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PERFECT MICANITE INSULATOR REG. U.S. PAT. OFF. and PERFECT EMPIRE INSULATOR REG. U.S. PAT. OFF.

MICANITE PLATE NO. 1
For general moulding purposes, milled to specified thickness.
MICANITE PLATE NO. 11
For general moulding, but is not exact as to thickness.
MICANITE PLATE NO. 2
For Commutator Segments, white mica, accurately milled, non shrinking 95 to 97% pure mica.
MICANITE PLATE NO. 3
For Commutator Segments, amber mica, closely milled, non shrinking 95 to 97% pure mica.
MICANITE PLATE NO 5
For cold moulding or bending; can be cut into strips with shears.
EMPIRE CLOTH NO. 5
Cambric base, oil treated, high dielectric, flexible, stands up under heat.
EMPIRE CLOTH NOS. 7 to 15
Same as No. 5 but heavier cloth and progressively heavier insulation and dielectric qualities.
EMPIRE CLOTH NOS. 22 and 32
Duck base, great mechanical strength, impervious to moisture
LINOTAPE
Empire Cloth in tape form, straight and bias cut ¾", 1" and 1½" wide.
EMPIRE PAPERS NOS. 104 and 115.
Kraft base, oil treated, thin yet high tensile and dielectric strength.
EMPIRE PAPERS NOS. 107 and 109
Gray rope, similar to No. 104. Supplied in sheets or tapes.
FISH PAPERS
Very tough and dense, yet flexible and a good insulator.
Plain: 15 and 25 thousands and 1/32" thick.
Paraffined: 5, 10, and 15 thousands and 1/32" thick.
FULLER BOARD
Pliable, smooth, tough, glazed insulating board.
5, 10, 15 and 20 thousands and 1/32" thick.

MICA INSULATOR CO.

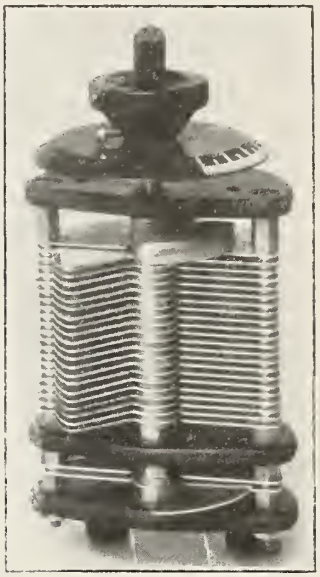
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Dealers Wanted

Vernier Balanced Condenser

The new ultimate, variable Vernier Balanced Condenser is now ready for delivery. This is without doubt the peer of condensers. Exclusive territories given on a quantity basis.

Made in 41, 23 and 13 plate sizes including vernier. List Price $6.50, $5.75 and $5.00.



RADIO SHOPPE

1431 Queen St. W., Toronto

It's Not Price—But Satisfied Customers that Build Businesses



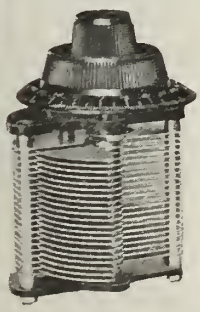
It's a poor business policy for anybody to say "Bother quality—what I want is low price." No matter what you buy you get just what you pay for.

United Radio Products are not built to meet a price but to meet the requirements of the Radio buyers.

The products are mechanically and electrically right and after three years we know that they have made friends wherever they have been sold.

We believe every dealer who is looking ahead will agree with the wisdom of our policy and we are ready to back him up by our full guarantee.

United Audio Frequency Amplifying Transformers are an attractive piece of merchandise—bringing in results—and satisfaction. List $4.50.



United Condensers have been accepted as standard and are selling in increasing quantities.

LIST PRICES

Plain 43 plate	$4.50
" 23 "	4.00
" 11 "	3.50
" 5 "	2.75
" 3 "	2.25
With Vernier Dial and Knob	
46 plate	$6.50
26 "	5.50

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A complete new silent call system for hospitals. Registers at nurses' quarters and office with time record, if wanted.

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New Birks Bldg.,
Montreal, Quebec

The Pierce Electric Company,
104 Richmond St. West,
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CONNECTICUT TELEPHONE & ELECTRIC COMPANY
MERIDEN CONNECTICUT

Canadian Triangle Conduit

"TRICABLE"



Armoured Cable is the safest and most economical method for protected

House Wiring

Indispensable in the installation of

Electric Ranges and Heaters

All sizes from 14/2 to 4/3 carried

in stock

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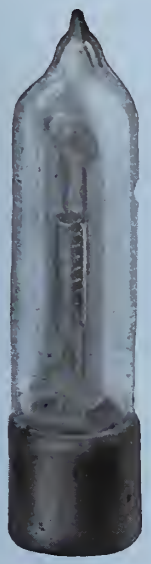
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Western Agents

COCHRANE STEPHENSON CO.

WINNIPEG - VANCOUVER

THOUSANDS ARE BUILDING THEIR RADIO SETS



R 215A Peanut Tube

The Peanut Tube is therefore a necessity.

For bringing in distant stations it has no equal.

Operates on a single dry cell battery.



R40 SOCKET

DEMAND YOUR SUPPLY
AND
SUPPLY YOUR DEMAND

Manufactured in Canada by

Northern Electric Company
LIMITED

MONTREAL TORONTO WINDSOR CALGARY
HALIFAX HAMILTON WINNIPEG EDMONTON
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"Makers of the Nation's Telephones"

MANUFACTURING
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Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and receiving Equipment

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Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

Dealers apply to nearest branch house for prices and discounts

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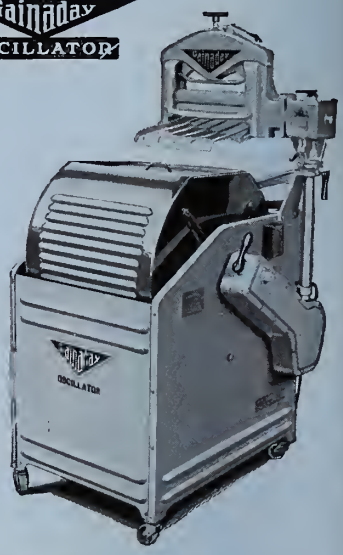
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Gainaday OSCILLATOR



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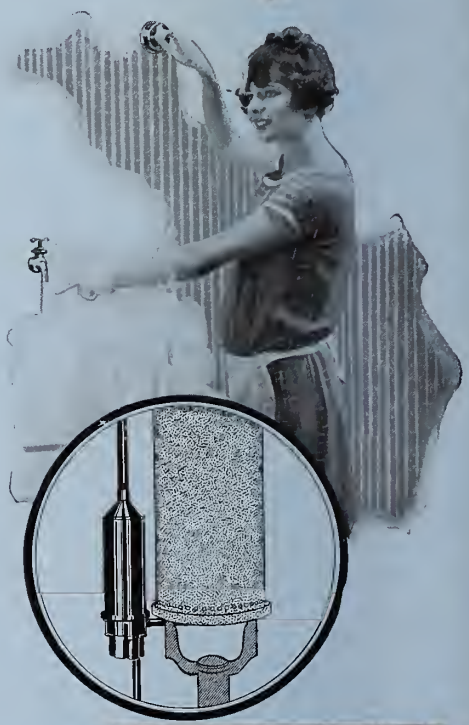
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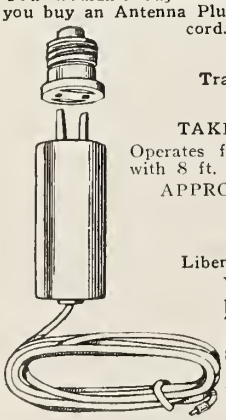
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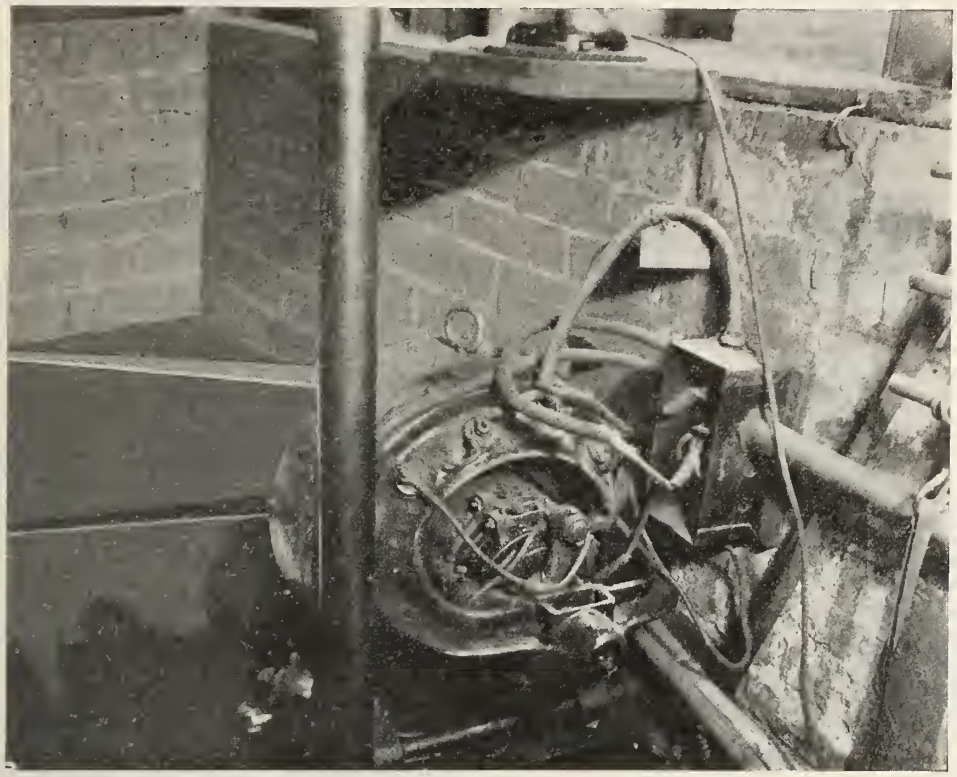
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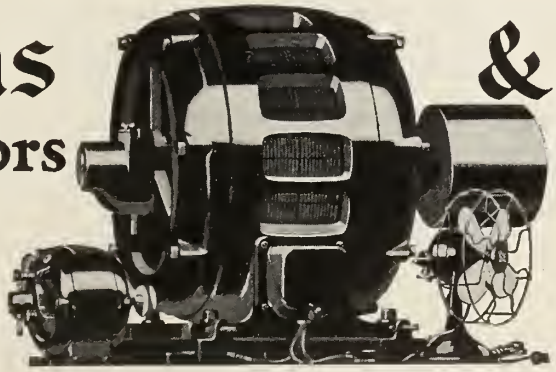
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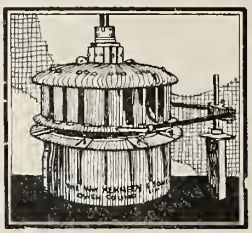
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Member Business Newspapers Association of Canada

Vol. 32 October 15, 1923 No. 20

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PUBLISHING HOUSE OF HUGH C. MACLEAN

Good News for the Radio Fan

Announcing a complete line of Exide Radio Batteries for all types of tube sets

EVERY radio fan who has tuned in with an Exide A or B battery will welcome the news that the popular Exide line has been extended to include two low-voltage A batteries. An Exide Radio Battery is now available for all types of vacuum-tube sets.

Whether you want a long-life storage battery for six-volt tubes, an A battery for low-voltage tubes, or a B battery, you can take your choice of Exide Radio Batteries and be sure of getting the right battery for your set.

For low-voltage tubes

The two newcomers in the Exide radio family are two and four-volt A batteries for tubes consuming .25 amps. at 1.1 to 1.5 volts and those using .06 amps. at 3.0 to 3.5 volts. These sturdy little batteries were specially designed to meet the requirements of WD-11, UV-199 and R-215-A vacuum tubes. Weighing less than 6 lbs. each, they are midgets in size, but giants in power.

Exide Radio Batteries give steady, dependable current with only occasional recharging. They make it possible for you to reproduce broadcast selections in clear, bell-like tones. When your set is hooked up with an Exide, you have ample power for maximum signal strength at all times. You can tune in distant stations with the most satisfactory results.

In service over a generation

For more than a generation the famous Exide Storage Battery has helped to turn the wheels of industry. Long before radio broadcasting achieved its present popularity, the Exide proved its worth in commercial and marine wireless; it is used today in a majority of all government and commercial wireless stations. When the Canadian public found in radio a new form of entertainment, the Exide became by reason of superiority the leading radio battery.

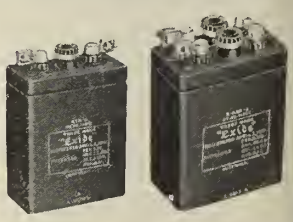
You can get an Exide Battery from a nearby radio dealer or Exide Service Station.

Ask the dealer for booklets describing in detail the complete line of Exide Radio Batteries, or write direct to us.



For six-volt tubes

Like all Exide Storage Batteries, the Exide A Battery for six-volt tubes is dependable and long-lasting. It is made in four sizes, of 25, 50, 100 and 150 ampere hour capacities.



Two and four-volt A Batteries

The new Exide A Batteries consist of one and two cells, respectively, with rated capacities of 12 and 24 ampere hours. The two-volt A Battery will heat the filament for 96 hours; the four-volt A Battery for 200 hours.



Exide B Batteries

give noiseless, full-powered service over a long period of discharge. Designed throughout to prevent electrical leakage. Capacity, 3 ampere hours.

Exide
RADIO BATTERIES

EXIDE BATTERIES OF CANADA, LIMITED

153 Dufferin Street — Toronto

ELECTRICAL NEWS

DEVOTED TO THE INTERESTS OF
A UNIFIED ELECTRICAL INDUSTRY

This contractor dealer is really worried



He is trying to locate mythical profits

What Makes Up Your Overhead?

A Complete Answer to the Question

By C. D. HENDERSON
President, Henderson Business Service

There is still some misunderstanding among some electrical dealers as to just what should be charged up as **Overhead Expense** or **Fixed Charges.** We therefore hope the following list will be of some help to readers who may be in doubt on the matter.

Charge these items to Overhead Expense or Fixed Charges:

Salaries

Owner or Partner, Bookkeeper, Stenographer, Clerks, Foremen. Office boy, Truck driver, storekeeper, etc.

Rent

Store, Office, Warehouse, etc. (whether owned or not).

Interest

5% on all capital invested and interest on all borrowed money.

Insurance

Fire, Theft, Accident, Business, Credit, Workmens Compensation.

Taxes

Federal, Provincial, Municipal, Licenses, etc.

Advertising

Newspaper, Program, Billboards, Circular letters, etc.

Dues

Chamber of Commerce, Trade Associations, Trade papers, Convention expenses. Donations.

Light, Heat and Power and Water Rates.

Delivery

Cost of running trucks, Business Auto. Bicycle and monies paid out for extra deliveries.

Commissions Paid for Procuring business.

Office Expenses

All Stationary, Ink, Pens and Pencils, Books, Telephone and Telegrams, Stamps and all other expenses in connection with office.

Store and Shop Expenses

Cleaning, Window Dressing, Wrapping paper, Twine, Repairs and Decorating. Repairing and



Can you tell whether this chap's grin is justified?

replacing lost tools and Operating Equipment.

Defective Goods

Repairing and Replacing defective and stolen goods, (make an allowance for this, each year).

Lost Labor

Workmens' time during dull seasons. Taking stock and replacing defective work.

Collections

Money paid out for collecting accounts and all legal fees.

Travelling Expenses

In connection with the business.

Bad Accounts

Accounts unable to collect or those doubtful. Don't overlook this as it sometimes runs as high as 2% of Sales.

Depreciation

On Office, Store and Shop furniture and Machinery—about 10% per year.

Sundry Items

All other items of expense which cannot be charged directly to your customers.

Get this firmly fixed in your mind:—Every article leaving your establishment must bear its proper proportion of these items no matter if it is sold over the counter or used on a time and material or contract job.

As to the percentage which must be included, you will have to find this out by a careful record in your own particular business. If it proves to be 25% of your sales then out of every dollar you take in you must lay aside 25 cents to cover Fixed Charges, before you can take out one cent profit.

We would suggest the reader cutting out this list of items and pasting it in his cash book or ledger as a reference and if duplications are required they can be obtained free of charge from the author of this article.

Does Advertising Pay?

Ask the man who kept the Victrola dog in that attentive attitude.

Ask the man that discovered chewing gum Wriggled.

Ask the man who taught Ivory Soap to stay on the surface.

Ask the man who proved holeproof hosiery.

Ask the man who has achieved a skin one loves to touch.

Ask the man who keeps cool in alphabetical underwear.

Ask dad; he knows.

A Few Wiring Notes

From Interim Report of N.E.L.A. Committee

Wiring systems are of two kinds, first the system of ground return such as the old grounded telegraph or telephone lines, or the one-wire systems on shipboard that used the frame of the ship as the return. These are not here considered, but only the 2-wire or multiwire systems.

The original 2-wire systems or multiwire systems, including the 3-wire and 5-wire systems, have all the wires insulated, not only from each other but from ground. Grounds were first introduced probably by accident, as in the Edison underground systems, where the neutral accidentally got grounded. Intentional grounds were also introduced when the system of grounding to prevent danger from high tension crosses was brought in. Initially, of course, there was but one ground on a system whether by accident or design. In the case of systems accidentally grounded other accidental grounds happened later. In the case of intentional grounds systems were first grounded by one ground wire to a water pipe or to a buried plate. Additional intentional grounds are put on from time to time, as when a secondary system is grounded at more than one house or service entrance or as when it is grounded at the transformer and also at the service entrance.

Normal Current Not Troublesome

So far as we know no trouble has ever occurred from these additional grounds due to the current normally used on the wires. Trouble, however, has occurred in that street railway current got onto the grounded wire at one point, and when leaving it at another point caused electrolysis.

With a few exceptions the intentional grounds are all outside the building, as the present code rules forbid any intentional grounds inside a building. It is understood, however, that there are an immense number of unintentional or accidental grounds inside buildings. Of course, a ground on a hot wire causes a short circuit or registration on the meter and is usually soon found and removed. A ground on the neutral or grounded wire, however, apparently normally causes no trouble whatsoever.

It is understood that wiremen frequently when they find a ground on the hot wire merely transpose the wires, leaving what was formerly the neutral or grounded wire to be used as the hot wire and leaving what was farmerly the hot wire to be used as the neutral or grounded wire with the additional ground still on it.

W. H. Merrill, founder-president of Underwriters' Laboratories, Inc., died Monday, September 17th at the Presbyterian Hospital of Chicago.

Planning a Good Store Layout

Features of Arrangement that Gives Maximum Display for Minimum Expenditure—Every Line Taken Care of

Store arrangement plans recently drawn up for the new store of Harry Jacobs, Flushing, L. I., by the merchandising division of the Westinghouse Lamp Company, are worthy of note. The work of this division is described in Contact by Robert B. Ely. As a practical help it prevents the spending of considerable money for undesirable equipment.

In the case under consideration the store was particularly narrow, so the layout was planned to make the store appear as spacious as possible. Wall cases were suggested instead of counters, and to make the impression of spaciousness more complete, considerable space was left around the entrance to permit free access in entering and leaving the doorway.

The merchandising arrangements were such as to require the customer to advance to the centre of the store for the staple products, such as lamps, fuses and other accessories, for which there is a constant demand. This was done so that the customer would see the more expensive devices on his visit to the store; these devices well displayed make an appeal to him and create a desire and inclination to buy if he can afford to do so. The portable lamps were attractively displayed on a table towards the rear of the store and kept illuminated so as to attract attention due to their brilliancy and color effect.

The general lighting of the store was taken care of by a separate installation of fixtures aside from those used for show purposes. As an aid to effectively demonstrating appliances, a table was suggested so that a customer could be comfortably seated by the table where the demonstration was made, and in order that one appliance at a time could be shown to the customer, getting concentrated attention on the particular device under consideration. Particular stress was laid upon keeping everything clean and neat, and dusting all exposed appliances at least once daily, as slightly soiled or dusty appliances can readily lose sales because of their unattractive appearance.

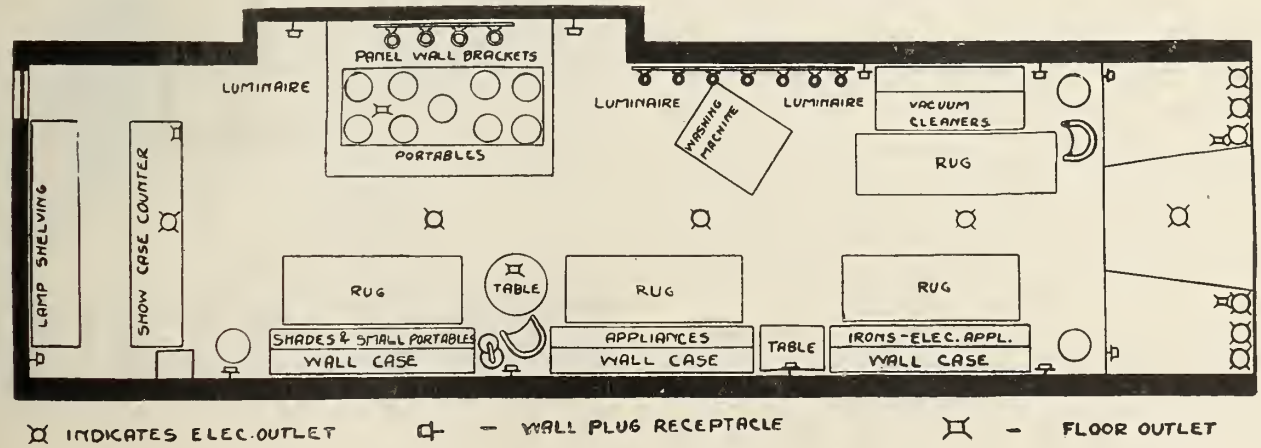
Some of the specific recommendations made in the store layout plan mentioned here are given below, as they apply not merely to the store under consideration, but to every store of this type.

Show Windows—Parquet floors; illumination by lamps concealed from view; background panelled in a light color, with mouldings and trim a darker shade; valance hung close to the plate glass directly beneath the transom bar for general appearance and tone; baseboard outlet for use in motion and illuminated displays, also a ceiling outlet for spot or colored spot lights to bring out particular window features strongly and attractively.

Store—Decorated in a light color with darker shade of the same color extending four feet above the floor; illumination should be of fairly high intensity, and a good example of modern lighting practice; rugs recommended under the portable lamp table and vacuum cleaner stand and in front of each wall case, both for demonstration of the cleaners and to add to the attractiveness of the store.

Fixtures—A vacuum cleaner stand to accommodate several cleaners, with outlet for easy connection; a shelving arrangement for the lamp stock so that various sizes of lamps could be attractively displayed in their cartons, and with a socket for testing before selling. Space was provided for washing machine, which should be connected to the electrical circuit so that it could be demonstrated by simply turning the switch.

Appliances—It was suggested that the electrical household devices be placed in the centre wall case so that they could be readily seen by all entering the store, and be convenient to the demonstration table; a floor outlet required for demonstrations.



A plan view of the store



Winter travel in the North Land

Special Radio Designs for North Country

Field Conditions Make Rugged Construction an Essential feature

Down the Mackenzie river, in the season of 1922, the Dominion Observatory party, as also parties from the Topographical Survey operating in this and other parts of the Dominion, carried radio receivers and at certain pre-arranged hours listened in and compared their chronometers with these time signals. From the eastern United States time signals were received in almost the extreme northwest corner of Canada, as also from the Panama Canal and Pacific Coast stations. Continual daylight from about latitude 60° north in the summer brought with it bad static conditions as well as poor receiving; this often prevented actual news being copied during much of the twenty-four hours but did not totally obscure the time signals that were needed in the work.

Field Sets Improved

Sets for field use have to be built strongly and must be able to receive reliably under the most adverse conditions, such as on wet ground in a tent, often during a rainstorm, as well as be able to stand an occasional complete ducking when the pack-horse falls into a creek or the canoe springs a leak. The only other essential difference between these time signal sets and those in use to receive the broadcasted concerts in our homes is that long wave coils are used.

It has always been the aim to reduce the weight and size as much as possible and yet maintain the necessary efficiency. Some years ago it required several hundred pounds of equipment with even the very limited range available. Two years ago about 400 pounds represented the essential radio equipment for a season's work, last year it was about half that, in fact a complete set with power for a month's ordinary time signal reception weighed only 20 pounds. There were three sets of this size along with sufficient battery "spares" that the Surveyor General's parties carried in the field and with which they could receive time signals from various large stations several times a day.

This year there is a very considerable further decrease in the weight of the necessary equipment, made possible by the use of newly developed more economical valves, which will require very little spare battery equipment to be carried to last a whole season's work, besides making it possible to have compact sets with all batteries enclosed in the same box.

Possibilities Demonstrated

While travelling in steamers or gasolene launches, over the long stretches of the Mackenzie and its tributaries the Dominion Observatory party set up their receiving set on board and demonstrated the possibilities of long distance reception, generally publishing a daily "newspaper" with news which otherwise could not be received in the district for from two weeks to many months afterward in the ordinary course of communication. An actual demonstration of the radiophone on a small scale was made far within the Arctic Circle, when both voice and gramophone music were transmitted from one house to another in Arctic Red River settlement near the delta of the Mackenzie. Telephone conversation taking place south of Los Angeles, California, was heard at Chipewyan on the shore of lake Athabasca. It is expected that though the distances to be covered are so very great, yet within a short time all the present isolated settlements as well as steamers will be linked up by a modern radio transmitting and receiving network—Natural Resources.



A new idea in Christmas window showcards. The illustration may be taken from any popular magazine

Radio Licensing Explained

How the Situation Affects the Average Dealer—Little Restriction Under the Act

By CAMERON DUNCAN*

In the year 1912 a conference was held in London, which was attended by delegates from practically every country, for the purpose of drawing up a convention which, when ratified by their respective governments, would govern the working of all radio communication stations under the jurisdiction of these governments.

The following year this convention was ratified by Canada, the ratification appearing in our statutes as The Radiotelegraph Act of 1913. This Act assumes control of all radio communication stations in Canada, both on shore and aboard ships resistered in Canada. Although the Act is primarily intended to regulate the conduct of commercial stations it contains a number of regulations which apply to all classes of stations. Of these the most far reaching and important is that respecting the licensing of all stations. The Act states "No person shall establish any radiotelegraph station or install or work any radiotelegraph apparatus in any place in Canada.... except under and in accordance with a license granten in that behalf by the Minister." In this connection it is interesting to note that in 1913 the word radiotelegraph was defined in the Act as including radiotelephones. There is no doubt left by the wording of the Act that a license is necessary to legally operate even a simple form of a radio receiving set.

How to Procure a License

Knowing that a license is required for the radio receiving set the questions arise as to how and where one can be procured, how much does it cost, etc. Before the popularity of broadcasting swept the country recently it was necessary to go through practically the same formality to procure a license for a receiving set as for a trans-Atlantic transmitting station. That is, all stations were in a sense classed together. It was necessary for the operators to be British subjects and to subscribe to a declaration that they would not divulge either directly or indirectly any information which might come to their knowledge through the operation of any radio station.



Every fan has his troubles

With the advent of a tremendous increase in the number of receiving sets, when broadcast receiving became popular, the form of license then used was found to unnecessarily limit the number of people would make use of radio receiving sets due to the nationality requirements, etc. Accordingly a new form of license for receiving sets was authorized. With these receiving licenses the formality of application has been reduced to a minimum. Whereas previously it was necessary to make written application to Ottawa for a license, they are now issued by the Postmasters of the larger cities and towns on the payment of the license fee of one dollar. These licenses are also issued by the Radio Inspectors and in the western provinces at some of the district headquarters of the Royal Canadian Mounted Police. There has been no change with regard to licenses for transmitting sets of any kind.

What the Inspectors Do

Part-time Inspectors have been appointed by the Department in a number of the more congested radio centres for the purpose of supervising the operation, particularly of amateur transmitting sets, and to see that the Department's regulations are fulfilled. The main purpose of the regulations is to so control the working of the stations that they will operate with a minimum of interference with one another. They in no way control the types of apparatus, method of installation, etc., but have to do with the conduct of the stations.

Regulations Re Transmission Times

There are at present no regulations in Canada restricting or limiting the times at which the amateurs may transmit. There have been voluntary agreements made by the amateurs amongst themselves in a number of localities that they will keep their transmitters silent during a portion of the evening. However, observations made by competent observers would seem to indicate that the amateur transmitters cause a surprisingly small portion of the total interference generally experienced. One of the duties of the Dpartment's Inspectors is to see that the amateur transmitting sets are properly tuned, and when they are so tuned they cause very little interference to broadcast reception except to those receiving stations located extremely close to them.

*Radio Inspector, Toronto District.

Doesn't It Happen Every Day?

Four Little Real-Life Anecdotes Showing Why Some Customers Bought and Some Didn't—The Lessons Taught are Applicable to Electrical Stores

Tying In to Business

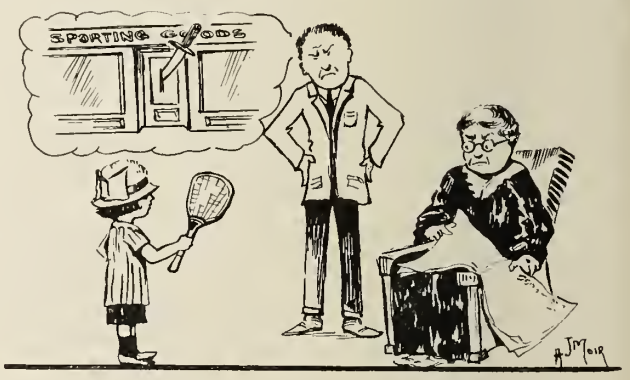
I bought a tie in a haberdashery store and took it home with a feeling that it was in perfect condition. For some reason or other, I put the tie away and did not bother to wear it for about three weeks. The first time I had it on my wife called my attention to a defect in the tie which I had not noticed. I of course took the tie off right away, and the next day I returned to the store where I made the purchase. The proprietor was quite willing to make an exchange, although three weeks had elapsed since the purchase was made. I have a friendly feeling towards this store as the result of the courteous manner in which I was treated, as it was the first time I had ever found it necessary to return so small an article as a necktie. I will undoubtedly return there for my next purchase in this line.

Make-believe Radio Dealers

The ignorance of some radio dealers regarding the equipment they sell is, as "Bud" Fisher puts it, "positively refreshing." This does not apply, I know, to the great majority of radio dealers, but there are some dealers of the smaller type who know less about the parts of which a set is constructed than the most green amateur. I became greatly interested in radio a few months ago and decided to undertake the construction of a simple receiving outfit. I read a few text books on the subject of putting together such a set and then went to a nearby radio store, the only store in the immediate locality of my home, to purchase the parts required in this particular circuit. I naturally expected to find the dealer supplied with not only the actual articles I required, but also with a fund of practical information for my further guidance. A few moments conversation with him made me feel that I knew a great deal indeed about radio in general and the construction of receiving equipment. As a result of this conversation, I decided to go elsewhere for the supplies I needed and am now making my purchases at a large down town store. Although it is not as convenient to go there every time I need any supplies, yet I know that I can always receive there any information I may desire about the little problems which every amateur runs up against in the construction of a radio receiving set and I confine my purchases solely to this store. My local dealer seemed to be satisfied to be able to distinguish a plate condenser from a variometer and has not awakened to a realization that what the purchaser of radio equipment wants more than anything else is information and advice.

Passing Up the Kiddies

My small sister came home the other day with a moving tale of her treatment in a sporting goods store. She had taken down her tennis racquet for restringing and it seemed that almost every other tennis racquet in the city also needed repairs. At any rate, there was a big crowd in the store, at noon hour, and apparently she stood there for 15 or 20 minutes before the clerks deigned to notice her, while adults



kept shoving ahead and had their needs attended to. Finally, of course, the crowd thinned, and a lordly clerk condescended to look after the wants of the tearful little lassie with her cheap racquet. She came home with a strong prejudice against that store and no doubt her opinion influences the adults of the family. What is more, some day she will be a buyer herself, and it will be quite the usual human procedure, if her prejudice against that store continues.

A Goodwill Letter

I got a letter the other day which struck me as a good idea. There would appear to be no difficulty in adapting it to the electrical business—it cements goodwill. Here is the letter, from my insurance man:

Dear Mr. Andrew:

I want to thank you again for the fine business which you have just given us.

While I know that in taking insurance from us you are getting the best insurance procurable, I do not want to accept your business simply as a matter of course. I want you to know that I appreciate it very much.

Yours very sincerely,

Personal Notes

Mr. A. T. Hicks has resigned as manager of the Oshawa Hydro-electric System to become a member of the firm of Harry Hicks & Co., electrical contractor-dealers and plumbers, Toronto. Mr. Hicks has been very prominently associated with the electrical industry holding, at the present moment, the position of president of the Association of Municipal Electrical Utilities.

Gordon W. Moss, of Moss & Stocks, electrical contractors, Toronto, attended the Washington convention of the International Association of Electragists, as the representative of the Toronto District Association of Electrical Contractors and Dealers.

Mr. C. T. Barnes has been appointed manager of the Oshawa Hydro-electric System. He was formerly with the Toronto Power Company and the London Electric Company; more recently he was assistant to Mr. D. H. McDougall, Toronto Electric Light Company. When the latter company was taken over by theHydro, Mr. Barnes transferred his allegiance to that body.

Mr. Harry Hicks, chairman of the Ontario Association of Electrical Contractors and Dealers, and Mr. George E. Davenport, representative of the Toronto District of the Ontario Association executive, attended the contractor-dealers' convention in Washington during the second week of October.

The Radio Shop, 54 King St. East, Oshawa, has opened for business. Don McKay is manager.

Turn It Over

Imagine a merchant starting business with a stock of $1,000. Imagine that he can turn his stock every day at a margin of 1 per cent. At the end of a year of 300 business days he would have a gain, not of 300 per cent, but of 1876 per cent.

Book Review

"Fundamentals of Radio," by James L. Thomas, published by the D. Van Nostrand Co., New York, furnishes a text that gives the elementary theory upon which all radio sets operate. It is a complete simple course for radio operators and radio mechanics. The book starts with a review of the elementary electrical principles and leads step by step through a discussion of the design and operation of all the component parts of a radio set. It is well illustrated, pocket size, 260 pages, cloth bound, and priced at $1.50.

Company Incorporations

The Continental Equipment Company, Limited, with a capital stock of $25,000, has been incorporated in Montreal. The firm will do a general electrical contracting business.

The Colonial Vacuum Cleaner has been registered by Yves Lee Bourdenne, in Montreal, as a trade name. Mr. Bourdenne is carrying on the repair of electrical appliances and machinery.

The Jamaica Hydro Electric Co., has been registered in Montreal.



Maxwells, Limited, St Marys, had this attractive display at the recent London Ont, Fair

Toaster Campaign Costs Money

Results Checked by B.C. Electric Service League

By J. LIGHTBODY*

The Electric Service League of British Columbia conducted an electric toaster campaign in Vancouver for two weeks from June 4 to June 16 last but figures now compiled prove that the campaign was not a financial success and some analysis may be a guide to future efforts on this line.

The proposal was made by a local firm of bankers following similar campaigns conducted in other parts of the continent. The bakers had found that by promoting the use of toast, the number of loaves consumed per family could be increased by one a week. This bakery firm offered to contribute $250 to an advertising fund if the service league would do the same.

By means of this bakery firm's drivers, all of whom were skilled in salesmanship, it was expected to sell enough toasters to provide enough profit to pay for the league's advertising.

The other electrical interests in Vancouver joined in the campaign, the following being the sum of the advertising expenditures:

Electrical Service League	$500
B. C. Electric Railway Co.	236
Value of car card space donated	150
Dealers advertising, say	50
Other car card advertising, say	50
	$986

The number of toasters actually sold as far as could be ascertained was as follows:

Sold by drivers	26
Sold by B. C. Electric Railway (	81
Sold by electrical dealers	194
Sold by other stores	100
	401

The branch which fell down on the selling campaign was, as may be seen, the drivers. The toasters were advertised at the regular price but the B. C. Electric Railway company offered the special rate of $1 down, balance payable in six monthly instalments as a special feature. This was used as an alibi by the bread wagon drivers as their reason why they could not sell toasters.

The cost of advertising per toaster works out at $2.45 each or 43 per cent. That the campaign would produce some later effect is not to be doubted but it is questioned whether the further sales can ever make up for the advertising expenditure It is doubtful if this amount of advertising and effort can ever be justified unless some special bargain or cut price feature is introduced and as that is against the spirit of the industry today, a short quick campaign hardly seems profitable.

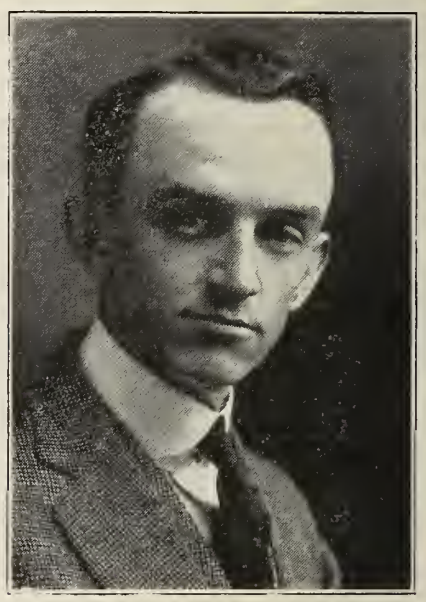
*Publicity Manager, B. C. E. R. Co.

Confidence

It has been said that the beginning of a sale is when a buyer begins to have confidence in a seller.

While confidence in an individual is often established, or at least started, upon first impressions, past performance is the true basis upon which confidence is founded.

Confidence is such an important factor that without it modern business methods would not be possible, and certain names and trade marks are of greater value than the physical property back of them, because they represent physical assets plus confidence.



C. D. Henderson, President, Henderson Business Service, Brantford, Ont.

Gathering of Contractor Dealers on November 27

Lawrence W. Davis, special representative of the National Association of Electragists, and James R. Strong, president of the same association, will visit Toronto for a one day session on November 27. It is planned to have a large gathering of contractors and dealers from all over the province to meet them. A similar session will be held in Montreal on October 28.

Business Changes

The Laurentian Hydro-electric Ltd., Montreal, has been recently registered.

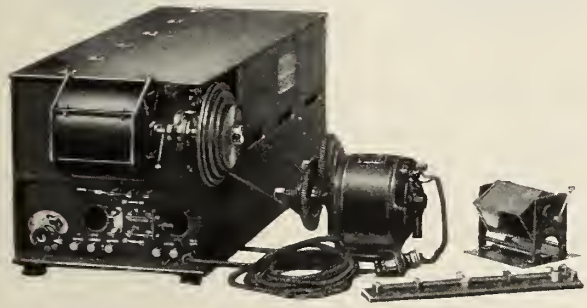
The Compagnie Electrique d'Henryville, of Henryville, Que., has been recently registered.

The Central Radio Co., of Montreal, has been registered by Gilbert Johnson.

The Latest Developments in Electrical Equipment

Portable Oscillograph

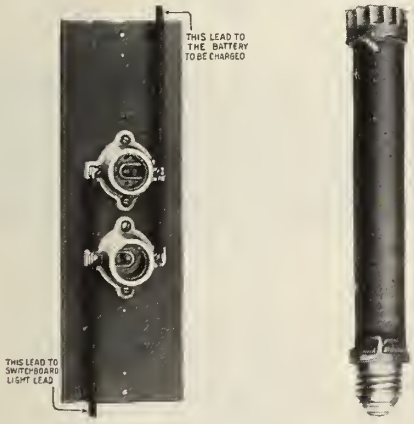
A portable oscillograph has been developed by the Westinghouse Electric & Manufacturing Company. The new oscillograph is complete in one unit except for the motor and film holder. The main unit is 11 inches wide, 11½ inches high and 25 inches long and includes the entire optical system, special incan-



descent lamp illuminant, a highly sensitive three element galvanometer, complete control equipment for vibrator elements (including 30,000 ohms of non-inductive resistors), and a transformer (for operating the lamp and motor for 110 or 220 volts supply at any frequency from 25 to 70 cycles. A special lamp control switch and automatic lamp-extinguishing switch enable the operator to apply a greatly abnormal voltage to the incandescent lamp to obtain results equal to those formerly secured only with the intense light of an electric arc.

Storage Battery Charging Unit

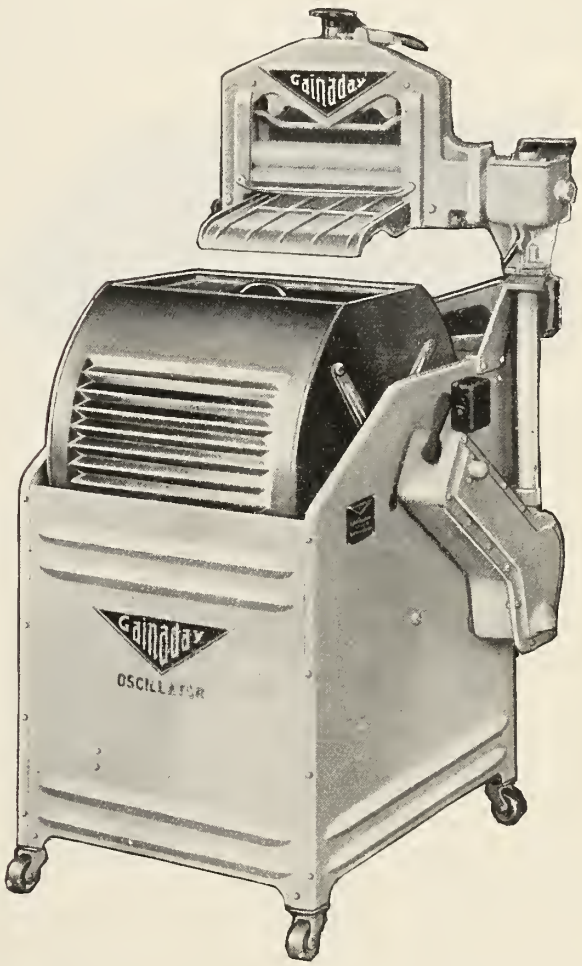
A simple method of charging automobile storage batteries from a 32-40 volt plant is found in the use of Vitrohm Resistor Units as illustrated. These units



are of the standard Ward Leonard Vitrohm construction—a porcelain-like tube upon which resistance wire is wound and then enveloped in vitreous enamel. The tube has a standard lamp base which fits standard porcelain receptacle, so that one or more units can be assembled on a heat-resisting base and connected to the service line. One unit is sufficient for charging any battery up to three cells; two units are necessary for four to six cells; three units, seven to nine cells; and four units, nine to twelve cells. These units are manufactured by the Ward Leonard Electric Company, Mount Vernon, New York.

Gainaday Electric Washers

The Pittsburgh Gage & Supply Company hase placed on the Canadian market their well-known cylinder type washing machine, in addition to which they have also introduced their latest development in the form of a full sized, reasonably priced, domestic oscillating machine. The cylinder machine is a large



capacity machine. It is made with galvanized or copper tub mounted on a frame which is made of rolled steel throughout. The Gainaday Cylinder which revolves and reverses every five revolutions, is made of heavy 17 oz. copper. The Oscillating machine is made up of a specially designed 17 oz. copper tub, tinned inside and mounted in a heavy sheet steel reinforced cabinet. Located in the bottom of the tub is a false bottom or corrugated agitator, which through the oscillating action of the tub, the soapy

water and air underneath the agitator is forced up rapidly through the perforations and through the meshes of the clothes in the tub.

Additional features which are distinctive on the Gainaday Washing Machines, are the specially designed all metal wringer which may be locked in any position; its exclusive roller action device assures even pressure and even wringing and its positive release is instantaneous in its operation. Gainaday machines are distributed in Canada by the Northern Electric Company, Limited.

Queen-Gray Potentiometer

In a description of their new standard potentiometer, for laboratory use, the Queen-Gray Co, write as follows:

The new Queen-Gray potentiometer is an intermediate resistance circuit thereby combining the advantages of the high and low resistance types. It has a total resistance sufficiently high to permit the



use of a switch in the main circuit without error and low enough to enable a slide wire of only one turn to be used for the last setting.

The main potentiometer circuit consists of 17 fifty ohm coils in the "tenths" switch, 10 five ohm coils in the "hundredths" switch (intermediate switch) and the 5 ohm "slide wire."

The current to operate is .002 ompere, therefore, the fall of potential over each 50 ohm coil will be .1 volt, for each 5 ohm coil .01 volt and for the entire slide .01 volt. The slide wire is divided into 200 parts and consequently a single division is equivalent to .00005 volts. The single division can be easily estimated to .2 thereby reading to .00001 volt which can be further reduced .1 or .000001 volt by means of a shunt coil as later explained.

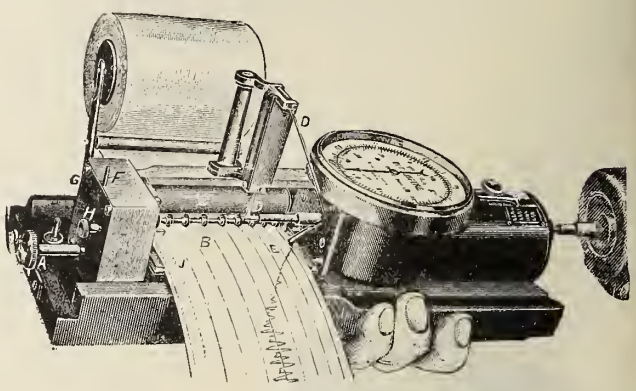
It is thus noted that means are provided for an adjustable potential from .000001 volt to 1.7 volts which can be extended to 17 volts when .02 ampere is made to flow through the potentiometer.

Hand Tachometer

A hand tachometer of interesting construction is being marketed by O. Zernickow. The device consists of a single spindle, selective range hand tachometer to which a recording mechanism is attached.

The tachometer part of the instrument indicates without timing or calculating r.p.m., surface speeds and speed variations. All of these are recorded by the tachograph.

The speed curve is drawn on a strip of paper



travelling through the mechanism as shown in the illustration.

The feed of the paper strip is accomplished through two rollers driven by clockwork. Stem A winds the spring, lever G. (located in the back and invisible in cut) stops the movement. Lever F. changes the speed of paper travel.



A handsome 3-light candle fixture for bedroom, dining room or living room, by R. F. Wilton. It comes in Butler's Silver or Old Ivory and sells to the trade unwired at **$8.75**

Current News and Notes

Bagotville, Que.

Five transformers have been ordered from the Canadian General Electric Co., for the power plant on Riviere a Mars.

Blyth, Ont.

A public meeting of ratepayers was held in Blyth, Ont., when W. T. Castor, of the Hydro-electric Power Commission staff, gave a talk on the cost of Hydro power supply. This was the last meeting to be held before the Hydro vote is taken on October 18.

Brampton, Ont.

At a recent meeting of council, the Bell Telephone Co. filed an application for permission to change its pole system to an underground conduit system. The matter was left over to the engineer, W. Treadgold and the Board of Works, who will give the required permission after making a survey.

Clifford, Ont.

The by-law which was voted on on Oct. 5 by the ratepayers to light Clifford by Hydro was carried by a large majority.

Cloverdale, B. C.

Mr. E. H. Dann, electrical contractor, has purchased a lot on the Pacific Highway. Mr. Dann will move his shop from the present location on the new McLellan road to his recently acquired property.

Cobalt, Ont.

A full supply of electric power has been turned on at the Lorrain Consolidated in the South Lorrain camp, and a big program of extensive mine development work is already under way.

It is reported that the Castle-Trethewey Co., will install Diesel engines in the new power plant which will be built on their property.

Fort William, Ont.

Contract for the construction of steel towers to carry the hydro-electric power line from Cameron Falls to Port Arthur and Fort William has been secured by the Port Arthur Shipbuilding Co. Cost, $200,000.

Hull, Que.

Plans are being prepared for a concrete dam and power house for the Hull Electric Co., by Walter J. Francis & Co.

Hamilton, Ont.

Bell Telephone Company engineers are now working on the placing of a new long-distance cable from Toronto to Hamilton. This service, when completed, will provide for a 264-pair cable of special construction to take care of long-distance business. The estimated cost of the work is $750,000.

Action in the agitation to put the city's wires underground is contemplated by Mayor Jutten. He stated that the report on the burying of the wires would likely come before the next meeting of the city council for consideration.

Jonquiere, Que.

An extension costing $75,000 is contemplated for the hydro-electric plant at Jonquierre, Que.

Kitchener, Ont.

The Kitchener Light Commission have announced they would move on December 1, into the new Jansen building, being constructed at the corner of King and Gaukel streets.

London, Ont.

The Hydro Department of London earned a surplus of $16,000 during the first eight months of 1923, as compared with a deficit of $21,000 for the corresponding period of 1922.

Meaford, Ont.

The construction of a transmission line and sub-station covering service for the town of Meaford has been authorized by the H.E.P.C. and arrangements hame been made to start the work immediately. Approximately sixteen miles of 22,000 volt three-phase line will be required from the nearest point on the Eugenia-Severn tie line to the town sub-station.

Metis Lake, Que.

Tenders are being called for a reservoir dam 918 feet long, at Metis Lake, Que., by the Quebec Streams Commission.

Montreal, Que.

W. H. Swift, Jr., who has been appointed radio engineer, Canadian National Rys., Montreal, was with the Westinghouse Electric and Manufacturing Co., for 14 years, and for the past five years has been in radio work in the United States.

New Liskeard, Ont.

Work has started on the transmission line from the Northern Power Co's development on the Des Quinze River to Porcupine, a distance of 125 miles. The transmission line will be built with steel towers and with transformer stations at each end, and stepping-down stations at various points where the power will be used.

Ottawa, Ont.

An extension of the hydro-electric system is to be made along the Montreal Rd., from Eastview to the easterly side of the police village of St. Joseph Orleans, at a cost of $11,000. This was decided by Gloucester township council.

Owen Sound, Ont.

The contract for installing the new heating plant in North Grey registry office has been awarded to J. Harding, of Durham, Ont.

Petrolia, Ont.

At a meeting of the Petrolia Hydro Commission H. H. Fair of Ayr, was appointed manager to succeed G. W. Currie.

Point Grey, B. C.

The tender of Farr, Robinson & Bird for the installation of the Shaughnessy Heights street lighting system with concrete standards, was finally accepted by the council. The contract price is $56,242.

Port Elgin, N. B.

Work has just started on a $10,000 power plant at Port Elgin, N. B.

Port Harvey, B. C.

The B. C. Electric Railway Company is going ahead with its survey of the Maple Ridge municipaliti with the view of putting a number of new connections through the district and giving the residents off the main roads electric lighting service. The extensions will probably supply Webster's Corners, Yennadon, Whonnock and Albion with a lighting service that they have been trying to obtain for some time.

Powassan, Ont.

Considerable progress has been made on the construction of the new development at Bingham's Chute on the South River near Powassan. The dam is nearly finished and the rock excavation for tail race, pipe line, and power house foundation is just about completed. The construction of the Diesel oil engine auxiliary station at North Bay is also progressing.

Quebec, P. Q.

Another lease at public auction of a waterpower has been decided upon by the Provincial Government, it being announced that the power designated under the name of the "Chute de la Cheminee," on the Batiscan River, Champlain County, will be offered for lease on the 23rd of October next.

St. John, N. B.

A recommendation that the Civic Commission allow the New Brunswick Electric Power Commission the use of some of their distribution lines and two of the large transformers, to permit the use of current from the New Brunswick Power Company, was adopted at a meeting of the Civic Power Commission.

The N. B. Hydro Commission will commence the erection of the Norton-Apohaqui-Millstream hydro lines as soon as material which has been ordered is available in sufficient quantity to permit the carrying on construction work rapidly.

St. John N. B.

A contract for an electric light transmission line at the Quarantine Station, Partridge Island, has been awarded by the Dominion government department of public works to Kane & Parker, St. John, at $3,589.

Stouffville, Ont.

A grand celebration was staged in Stouffville, Ont., on Sept. 28, on the occasion of the turning on of Hydro Power.

Toronto, Ont.

There are 52 lights on University avenue, all of 250 watt strength," stated Commissioner Chisholm recently, in discussing criticism that the said street should be better lighted. "We made an inspection as to the efficiency of the lights and it was found that the trees had a tendency to interfere with the lighting of the avenue."

The Ontario Hydro Electric Railways will build a terminal station at the Toronto terminus of its Toronto and York District, Mimico Division line, which extends from Toronto to Port Credit. It will be built on land leased from the Toronto Harbor Commission at the nominal rental of $1 a year, and will be located between the loop at the western terminus of the Commission's Lake Shore Road line and the present radial railway tracks, near Jane St.

Trenton, Ont.

The Hydro-electric Power Commission it is reported is preparing to extend their lines in the Trenton district, and a meeting of all farmers in the Trenton-Wooler area is to be called at an early date, when questions of costs, power, etc., will be fully discussed.

Vancouver, B. C.

A definite proposal to the electors regarding the hydro-electric plans on which J. G. G. Kerry, adviser to the city, has made an exhaustive report, will be submitted at the December election.

Windsor, Ont.

Petitions for the making of London street, west, from Ouellette avenue to the Windsor city limits a white way street, are now being circulated. The type of light called for in the petition is the bracket lantern, carried on trolley poles, similar to those now in use on Ouellette avenue.

T. U. Fairlie, Hydro engineer, is remaining in Windsor during the time the work on the Windsor street railway line is being proceeded with.

Winnipeg, Man.

City council let contract for the supply and erection in the power house at Point du Bois of three 6,500 kv.a. generators for direct connection to double reaction turbines and for spare parts for same to the Swedish General Electric Ltd., Toronto, at $213,000, together with $5,275 for spare parts.

Wiring Contracts Awarded

Baden, Ont.

C. Lederman, Baden, $6,000 house.

Brantford, Ont.

Paterson Electric Co., Toronto, $60,000 high school.

Brockville, Ont.

A. G. Doblin, $7,300 residence on First Ave.

Charlottetown, P. E. I.

Brown & Binns, $5,000 residence on Kent St.

M. Brown, $15,000 house on Dorchester St.

Jas. Brown, $4,000 house on Richmond St.

Cooksville, Ont.

W. Irwin & Sons, $8,000 church on Dundas St.

Hamilton, Ont.

Wm. Thornton, 346 Weir Ave., houses on Tragina Ave.

Kapuskasing, Ont.

Robinson & Robinson, community hall.

Kitchener, Ont.

Mattell & Bierwagen, $25,000 house corner Waller & Agnes Sts.

London, Ont.

Commercial Electric Co., $14,000 house on St. James Street.

Lavender Electric Co., $8,500 house on Marley Place.

Montreal, Que.

Booth Bros., 5727 Sherbrooke W., 2 houses $14,000, Royal Ave., N. D. G.

E. N. Penny, 24 Oliver St., $25,000 stables, on Rioux St.

New Liskeard, Ont.

Wood & Ryder, school.

Oakville, Ont.

J. Kennedy & Son, Acton, Ont., $18,000 theatre.

Ottawa, Ont.

H. L. Allen, 272 Bank St., house on Broadway Ave.; $4,500 house on Brighton Ave.; $4,500 house on Sunnyside St.; $6,000 house on Grove Ave.; $6,500 house on Centre St.; $4,000 house on Holland St.

Marchand Electric Co., $5,000 house on Douglas St.

J. A. Ellicott, $3,500 house on Lorretta St.

G. Young, 51 Spruce St., $5,000 house on Harmer St.

Wallace Chugg, 761 Bank St., $4,000 house of Craig St.

Art Davis, Branson Ave., $7,200 double residence on Russell Ave.

Stan Lewis, 63 Metcalfe St., $70,000 church on 3rd Ave.

E. Poirer, Hull, Que., $4,500 residence on Java St.; $6,000 house on Westmount Ave.

Lewis Stanley, 69 Metcalfe, $8,500 house on Keefer St.

J. Thomas, Westboro, P.O., $5,500 house on Ossington Ave.

J. Davis, Bronson Ave., $9,000 house on Linden Terrace.

Robt. Lee, 262 Lisgar St., $4,000 house on Rosemere Ave.

P. E. Marchand, 18 Rideau St., $2,500,000 hospital.

H. L. Allen, 272 Bank St., $5,000 house on Ossington Ave.; $4,000 house on Holland Ave.; $20,000 apartment house corner Bessemer and Cobourg Sts.; $7,000 house on Broadway Ave.; $5,000 house on Armstrong St.; $6,000 house on Wendover Ave.

J. W. Ellacott, 595 Bank St., $5,300 house on Clarendon Ave.; $6,000 house on Fairmont Ave.; $5,000 house on Cameron St.; $5,000 double residence on Aylmer Ave.; $5,000 house on Riverdale Ave.

J. N. Cherry, 50 Victoria, $6,000 house on Fentiman Ave.; $7,000 house on Ossington Ave.

E. Ladouceur, 126 Willow, $5,000 house on Hawthorne Ave.

Jas. Milks, 26 Warren Ave., $6,000 duplex residence on Byron Ave.

Outremont, Que.

E. Labelle, 453 Decarie Blvd., $18,000 cottage on McCulloch.

J. A. Anderson & Co., school on Lajoie Ave.

Port Credit, Ont.

E. McNeice, Port Credit, $7,000 house on Mississauga Rd.; $5,000 dairy on Park St.

Harris & Morrison, Port Credit, $6,000 house on Mineola Rd.

G. Lee, 6 Howard St. ,Toronto, 6 stores and apartments, $30,000 on Main St.

H. Moore, Cooksville, Ont., $5,000 house on Forrest St.

Port Hope, Ont.

C. Pillsworth, addition and alterations to Childrens Shelter.

Souris, P. E. I.

Walter P. Doull, electric wiring and fitting, government building, $670.

St. Lambert, Que.

C. E. McGregor, 55 Mercille Ave., $8,800 house on Pine St.

Sault Ste Marie, Ont.

Taylor Bros., 134 Gore St., $2,500 church on 6th Ave.; $7,000 house on Pim St.

Stratford, Ont.

W. J. Gaul, Charles St., $3,600 house on Cobourg St.

Jas. Brandy, Cobourg St., 2 houses on Yonge St., $6,000; $5,000 house on Yonge St.

Sortin, Que.

J. Byron, 1665 Delorimer Ave., $10,000 bunk house, C.P.R. Yards.

Sarnia, Ont.

Chambers Electric Co., $25,000 office building; 4 stores and offices, $35,000.

St. Catharines, Ont.

A. B. Cudney, 22 Thomas St., $6,000 house on Russell Ave.

Sussex, N. B.

W. A. Haley, $15,000 telephone exchange and a $9,000 store.

Three Rivers, Que.

P. Rochon, 21 Badeaux St., $25,000 schools.

Tecumseh, Ont.

F. D. Reaume, 6, room addition to $40,000 school, at $538.28.

Toronto, Ont.

Richardson & Cross, 81 King East, subsidiary buildings, Bathurst St. for Toronto Transportation Commission, $150,000.

P. J. Dunn, 234 Fairview Ave., 2 duplex houses, 142-4 Howard Park Ave.

R. M. Mitchell, 140 Leslie St., 1 pair houses $8,000, west side 8th Ave. near Gerrard E.

S. Johnston, 111 Curzon St., 1 pair houses $7,500, west side Cannon near Gerrard E.

J. Howard, 74 Russett Ave., house and garage $7,800, at 611 Windermere Ave.

N. McLeod, 808 Danforth Ave., $7,500 house west side Coxwell Ave. near Queensdale Ave.

Taylor Bros., 25½ Norwood Ave., 6 pair residences $7,500, Pickering Ave.; $15,000 public garage and showroom north side Danforth Ave., near Dawes Rd.; 1 pair houses $7,000 south side Malvern Ave.

Smart & Walsh, 130 Bingham Ave., $4,000 house, 19 Strathmore Blvd.; 1 pair houses $7,000, 6853-5 Strathmore Blvd.

Bennett & Wright, $100,000 garage, etc., north side Bancroft St.

E. R. Meakes, 336 Woodfield Rd., 1 pair houses $7,000, 70-72 Malvern Ave.

P. J. Dunn, 243 Fairview Ave., apartment house and cafeteria, 200-12 Bloor West.

Black & McDonald, 1220 Dundas W., 2 apartment houses, north west corner Bloor W., and Quebec Ave.

H. Stacey, 1821 Gerrard E., 1 pair houses $8,000, 115-117 Eighth Ave.

G. Armstrong, 1391 Ossington Ave., $7,500 house west side Brummell Ave. near Baby Point Rd.; $4,000 house east side Brookside Ave. near St. Johns Rd.

Nelson & Hawkins, 99 Adelaide W., alterations to garage $20,000 1453 Queen West.

T. B. Kilner, 601 Jones Ave., $3,500 house north side Robins, near Coxwell Ave.

Nelson & Hawkins, 99 Adelaide W., $150,000 addition to lunch room 11-13 King East.

Toronto Elec. Co., 101 Duke St., $40,000 office building Queen East and Connaught Ave.

H. Thomas, 490 Kingston Rd., 1 pair houses, $8,000, 504-6 Strathmore Blvd.

Mr. Reid, 61 Rhodes Ave., $7,000 bungalow at 619 Strathmore Blvd.; $5,000 house south east corner Strathmore and Woodmount Aves.

Elect Electric Co., 113 Victoria Park, 2 pair residences $6,000 pair, each, north side Rhyl near Haslett Ave.

B. Byford, 5 Bushel Ave., 2 pair residences $8,000 pair, east side Glebemount Ave., near Sammon Ave.

Wm. Gibson, 156 Beech Ave., 1 pair houses $8,000, north side Riverdale, near Carlaw Ave.

Verdun, Que.

National Elec. Contracting Co., Ltd., Montreal, Que., $50,000 addition to church corner Wellington and Gordon Aves.

Valois, Que.

R. Richard, Ste. Anne de Bellevue, Que., $35,000 school.

Walkerville, Ont.

S. Usher, Sandwich St. E., $5,000 house on Victoria Ave.

Westmount, Que.

W. Staines, 587 Cadieux, apartment house north east corner St. Catherine and Melville Sts.

Windsor, Ont.

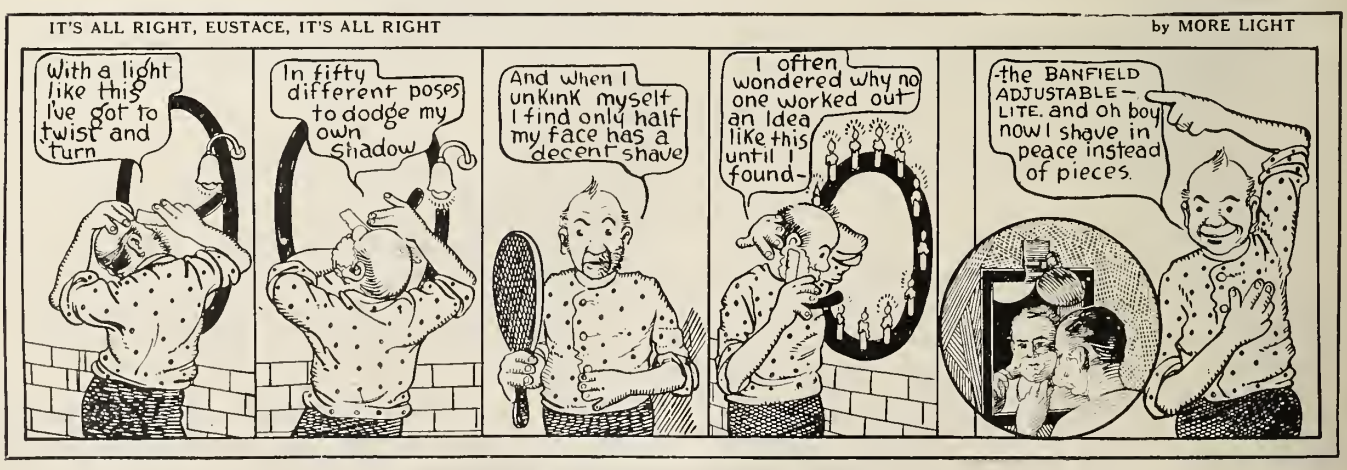
Ray Perry, Bridge Ave., $5,000 house on Parent Ave.

A Correction

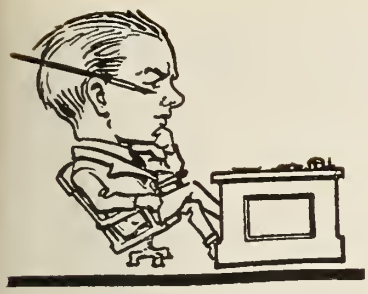
The September 15 issue of Electrical News contained an item to the effect that the wiring contract in connection with a $90,000 apartment house in Montreal had been awarded to L. C. Barbeau & Co., Ltd. This should have read 'awarded to W. Staines, electrical contractor.' The only connection L. C. Barbeau & Co. had with the installation was in supplying fixtures to the electrical contractor.

Smith & Stone Manufacturing 660 Watt Sockets

Smith & Stone, Ltd., are now manufacturing a complete line of 660 watt porcelain sockets and receptacles, and are offering them to the trade at prices practically the same as the old 250 watt line, which are now considered obsolete.



Novel advertising by W. H. Banfield & Sons



The Editor Comments

Possible Christmas Business

Just a few weeks ahead looms up the most important merchandising time of the year—the Christmas selling season. Some idea of what this time should mean to the electrical dealer is gained from the statements of retail merchants in other lines who claim that their Christmas business amounts to from 15 to 25 per cent of the whole year's turnover.

Such a result is not impossible of achievement by any man who controls the advertising, store management and selling of any establishment that retails electrical goods. An examination of the methods used by these other successful retailers mentioned reveals nothing extraordinary, not even an exhaustive personal effort. They do the business by applying sound merchandising methods, which in most cases they have learned by long experience and natural adaptability to the lines they handle.

It is true that to equal their success requires more effort from the electrical dealer than is put forth by the average retailer. There are special difficulties that must be mastered. For one thing, he must educate the public to electrical goods as Christmas gifts. Another difficulty is that non-electrical stores handle some of the most desirable gift goods. Another is that outside work must be cut down to a minimum.

These disadvantages make the job harder, but they do not make it impossible. There are tricks to every trade, and if examined without prejudice, it will be found that there are compensating advantages to the electrical business. The main conditions that assure of success in Christmas selling, (assuming of course the desire to do so) consist of an early start, an attractive selection of merchandise, brainy window dressing, and shrewd advertising.

Illumination Ever Keeping on

An indication of the rapid advances which have been made in industrial illumination is presented by H. W. Desaix in a paper recently read before the Illuminating Engineering Society. A survey was made of various silk manufacturing plants, and the data thus obtained was supplemented by making experimental installations, with very gratifying results.

In the case of weaving plants, it was found that the best available luminaire consisted of a rugged prismatic glass reflector, about a foot in diameter, with open top and bottom. The distribution curve of this unit showed a sharp cut-off at 60 deg. from the vertical, falling away sharply after 15 deg. The units were mounted 12 feet from the floor, with 13 feet 3 inches between units along rows, and 7 feet across. With 200 watt lamps, readings were taken of 30 foot candles on the warp, tapering to 15 foot candles in the aisles and on the drives. Such varied intensity is without objection in this case, the looms requiring a much higher intensity than the drives and aisles.

The system, installed with modern conduit system and convenient switching arrangements, was found to cost one half a cent per foot candle per square foot.

The main point of interest, however, is the fact that all concerned believed that the results obtained were worth the effort expended. Drop cords, with and without reflectors, and in some cases bowl type enamelled steel reflectors, had been in use, with unsatisfactory results, and the system as described was a revelation.

We are fast getting to a point where every branch of industry will be fitted with exact lighting specifications, and when every captain of industry will be willing to listen to the arguments of the lighting engineer. The work of Mr. Desaix, and many others, is paving the way.

Will Japan Buy?

An investigation of the trade opportunities created by the Japanese earthquake, reveals some matters that will be of interest to Canadian manufacturers.

There is, of course, at present a heavy demand for reconstruction materials, but it appears that the United States and Great Britain have a large share of the electrical end of this business. It is also true that Japan has during the last decade made vast extensions to her works for the production of electrical and other manufactures, and has even built up a considerable export trade. According to the Japanese Minister of Finance, the damaged zone does not cover those districts which produce goods for export or any of the other principal products of the country and it is firmly believed that the effects of the disaster upon the commercial and industrial condition of Japan will not be great.

The actual damage done to electrical plants is not

yet known, but it appears that many days did not elapse before electrical service was resumed in parts of Tokio, and electric tramways and railways in the suburbs were in operation. The Tokio Electric Light Co., Ltd., has its property and operations scattered over a very extensive area beside Tokio and Yokohama, and the major portion of its generating capacity is far removed from the scene of the disaster and remains intact. This and other similar information dispels the belief that there will be any outstanding demand for central station equipment as a result of the disaster.

Materials which are in demand are those required in connection with the application of electricity for lighting, and domestic use. These materials must be sold by the Canadian manufacturer in competition with English, United States and German firms. In certain instances, Japanese practice is not the same as ours, special threads and devices (as the bayonet socket) having been introduced by British firms. Also, Japan has been supplying herself with much of the smaller goods.

This opposition we have mentioned, however, must be faced in almost any export field. The Japanese market presents opportunities because of the destruction that has been wrought, that must be made good. If the right conditions as to price, quality and suitability are made, Canadian electrical goods can be sold on the Japanese market.

The Acid Test Says a well known banker: "One of the several tests of the right of a man to have a banking credit is his ability to clean up all his loans once a year. This is a fundamental test and for this reason, the money borrowed from a bank on short time paper is supposed to be for the purpose of earning money. If the business which borrows cannot turn the goods bought with the bank money so that the loans may be within a period, then the business is warehousing, not merchandising goods, and is not a good risk. No matter how large and valuable its assets may seem to be, it is not turning them over; therefore it is a dead business and not a live one. No one wants to lend to a dead business no matter how respectable it may be. The once a year clean-up compels a business to reduce its stocks to a minimum once a year. This cleaning of the sheet is not always feasible. It is not a rule to be applied without reason. But if the clean-up cannot be made it is up to the banker to find out why. Then, if circumstances justify he can buy the loan over again—renew the note. It is the same in the banking business. Many a man with the ideal of building a big bank rather than a good bank has bought more deposits than could be sold at a profit. If a stronger institution does not take it over, either liquidation at a loss to stockholders, or failure at a loss to both stockholders and depositors results.

"During the course of my banking experience I frequently came into the affairs of bankrupt retailers, sometimes being appointed trustee or receiver of these estates. And almost always I found that the reason for the insolvency was the failure to keep stocks low and turning. The bankrupt may have started without enough capital and he may have started with plenty of capital, but nearly always he got his money tied up in slow moving merchandise. Sometimes he had bought badly and was afraid to confess his mistakes, or again he hunted for too much profit and thus held the goods until they could not be sold at any sort of a profit. Instead of keeping the goods turning over to pay bills and re-establish credit he let his stocks freeze to the shelves. When the creditors wanted money he had to liquidate and go out of business. He did not know that the place to finance a business is inside of it—by turning the goods. Nor did he realize that the rate of turnover is the best index to the health of a business—that it shows business conditions better than does the beat of the pulse of a human being."

The First World Power Conference

The British Electrical and Allied Manufacturing Association in co-operation with technical institutions and other trade associations in Great Britain some time ago conceived the idea of arranging for a World Power Conference to be held during the British Empire Exhibition in London Next summer.

The purpose of this conference will be to consider how the industrial and scientific sources of power may be adjusted nationally and internationally.

In response to an invitation to Canada the Honorable Charles Stewart, Minister of the Interior, authorized Mr. J. B. Challies ,his Director of Water Power, to fall in with the suggestion of the Organizing Director of the Conference that he act as Organizing Secretary for Canada. A tentative programme for Canada was drawn up and Mr. Challies was then directed to proceed to London to confer with the British authorities with a view to making Canada's participation both worthy of her achievements in hydro-electric matters and consistent with the plans of the British Committee.

Important conferences with this Committee in London and with the French Committee in Paris, at which representatives of other European countries were in attendance, have just been concluded. As a result of these conferences a mutually satisfactory basis for the First World Power Conference has been agreed to by all the principal countries concerned. Germany, Austria and Prussia have not yet been invited to participate. The Conference will be held in London next July.

Vitreous Enamelling in Electric Furnace

Gas Fired and Other Types Have Been Superseded—Requirements of this Work—Some Cost Figures

By J. L. McK. YARDLEY*

True enamels, or opaque glasses or glazes, produced by covering the metallic material to be enameled with a suitable mixture and heating both in a kiln until a glossy surface is obtained by fusion of the coating, are distinguished from japans or stoved lacquers by the fact that they are of an exclusively mineral nature while the latter are of vegetable origin entirely. The temperature required for vitreous enameling is accordingly very much higher than for vegetable enameling, though it is lower than that required by the burning of vitreous porcelain, with which, owing to some similarities in composition and appearance, it has very generally been confused.

Contamination Chief Problem

Prevention of contamination of the enamel through the products of combustion has been one of the chief problems, both in the preparation and in the application of enamels. Together with proper temperature, requisite amount and distribution of heat, life of refractories and operating cost, prevention of contamination has been a principal consideration in all the furnace developments in this industry.

New Types of Furnaces

Within recent years, a number of improvements upon the original clay muffle type enamelling furnace have been proposed and employed. The most important of these are:

1. Carborundum or carbo-frax brick muffle furnace.
2. Intermittent gas fire furnace.
3. Electric furnace.

The carborundum muffle furnace has been a development resulting from the improved bricks of this material which have become available and the fact that this material has only about one-eighth the thermal resistance of fire clay.

Gas Fire Furnace

In the intermittent gas fire furnace the gas is burned directly in the chamber and the chamber and the chamber walls are heated above the enameling temperature. The gas is shut off and enamel coated ware is inserted, and the enamel fused under falling temperature conditions, the work absorbing heat from the surrounding walls.

Advantages of Electric Furnace

The electric furnace for vitreous enameling has resulted from the desire to eliminate contamination and at the same time reduce the wear and tear upon furnace refractories, due to high flame temperatures. The idea has been to employ a heating source as uniformly distributed as possible at the walls of the furnace chamber, which would operate at a temperature above the necessary enameling temperature only sufficient to force the heat into the ware in the desired time. A number of advantages have been indicated, such as,

*General Engineer, Westinghouse Elec. & Mfg. Co.

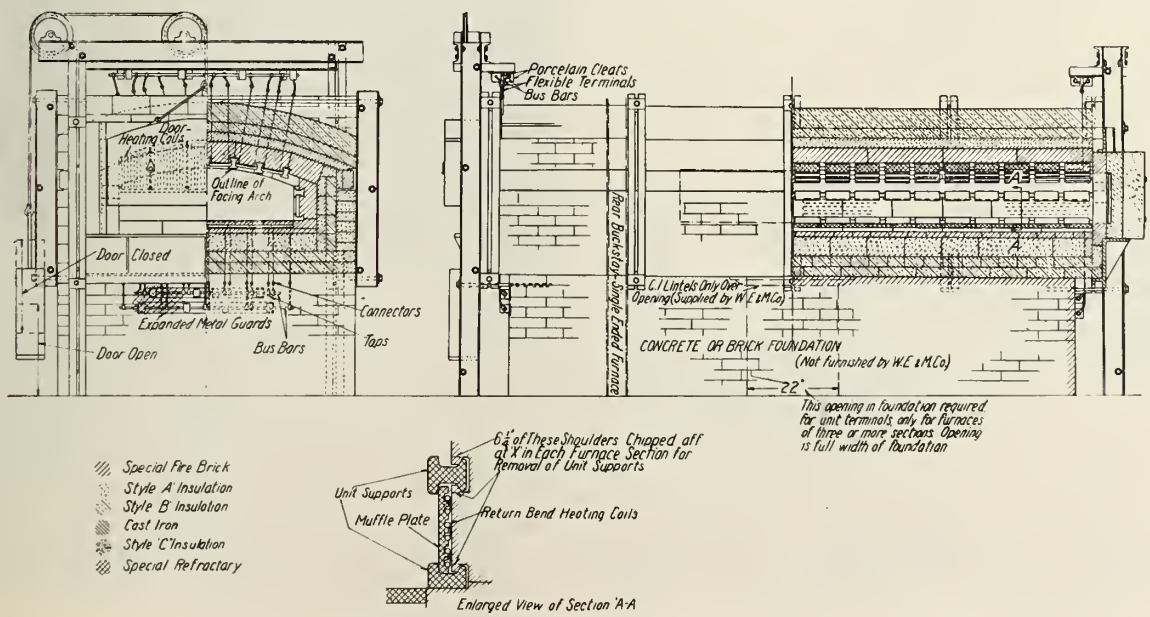


Fig. 1—Electric enamelling furnace of chamber type, showing general construction

1. Smaller amount of burned and blistered ware.
2. Greater reliability, that is, less time lost due to furnace being too hot or too cold for proper enameling.
3. Saving in space by eliminating coal handling, oil or gas piping, storage or generation.
4. No possibility of contamination from fuel gases and owing to low temperature of furnace chamber refractories, no likelihood of contamination within the furnace chamber whatever.

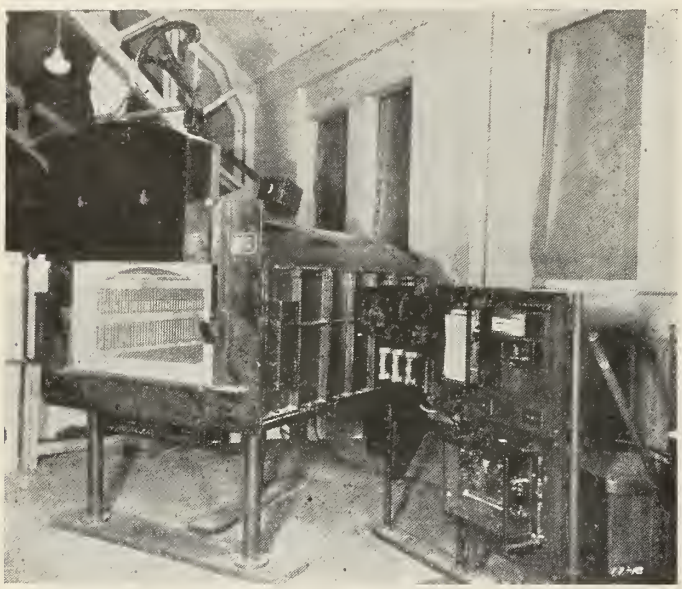


Fig. 2—Chamber type of electric enamelling furnace. showing mounting of heating units

Indications as to economy are as a result of the past year or two's experience, that the cost of operating the electric furnace, when a moderate power rate is obtained, is closely comparable to the cost of operating the clay or the carborundum muffle furnace. With power at less than 1c per kilowatt, a lower cost even, may result.

Some Cost Figures

Clay and carborundum muffle furnaces produce five foot enameled bath tubs at an overall fuel and maintenance cost of from approximately 30c. to 90c. per tub, or a total operating cost of from approximately 90c. to $1.50 per tub. This is with an enameling labor cost of 60c. per tub. With the same enamel-labor cost of 60c. per tub and power at 1c. per kilowatt hour, the comparative total cost in enameling with the electric furnace is $1.20 per tub. This closely coincides with the average fuel fired furnace total operating cost. This is on the basis of 53 kilowatt hours power consumption per tub and 5c. per tub maintenance. This is bearing in mind that a total poerating cost should include all fuel and labor for firing, handling ashes, repairs on furnace idle periods,, rejections, lighting off periods, etc.

A number of vitreous enameling electric furnaces have been installed which exhibit considerably different features of design and construction. One of these is used to bake either of two classes of material—cast iron stove parts to be baked for nine minutes at 1250° F., and sheet steel stove parts for four minutes at 1400°. The furnace is of 118 kw., 230 volts, 3 phase, 60 cycle, connected capacity, has a maximum temperature range of 2000° F. and, under the operating conditions, is estimated to have a capacity of approximately seven pounds of metal per kilowatt hour. The inside dimensions of the working chamber are 5 feet deep, 3-1/2 feet wide and 23 inches high. The interior is divided horizontally into two compartments by the trays carrying the work to be enameled and by two narrow shelves at either side of the chamber upon which the trays rest. Nickle chromium heating elements are mounted in vertical plane away from the side walls and are distributed about evenly between the upper and lower compartments.

Electric Furnaces

Electric enamelling furnaces of chamber type have been in operation for a considerable number of months in which heating elements have been mounted in roof and floor as well as side walls for the purpose of causing the heat to strike the charge from all directions and distribute uniformly throughout the chamber. By this uniform distribution, it has been sought to force the maximum amount of heat possible in a given time into the work without raising the temperature of the heating elements themselves. In the latest furnaces the wall

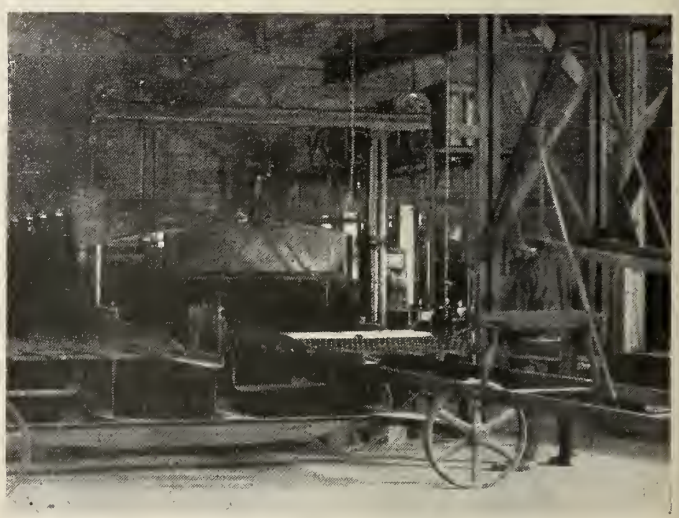


Fig. 3—Electric furnace used for enameling sheet iron ware. Charging mechanism in operation

coils are crowded somewhat towards the doors for the purpose of releasing a greater percentage of heat per unit wall area and compensating for the cooling effect of the door in the maintenance of uniform temperature. The average maximum kw. released may be as low as 1.85 kw. per square foot of wall heating surface, near the door it may be in the neighborhood of 2.5 kw. per square foot, or greater, with-

out increasing the watts released per unit of the heating element itself.

For Enamelling Sheet Iron Ware

Another furnace of this general type has been in operation for some months in the enameling of sheet iron ware that is used about stoves and ovens. Fig. 3 is a front view of the furnace showing the mechanism for charging the work and its supporting racks into the furnace.

Depending also upon the gauge and type of ware, from 18 to 23 loads of from say, 35 to 40 pounds each, ware plus enamel, are burned per hour. A comparison of the weight of work and of racks each charged indicates improved economy would result could charging mechanism and practice be changed so as to leave one set of racks permanently in the chamber. The following are typical test runs made on this furnace:

Test Runs on Electric Enamelling Furnace

Total weight of racks ...	126-1/2	126-1/2
Leads per hour	22-2/3	19
Gauge of metal	24	24
Weight of steel per sq. ft..	1 lb.	1 lb.
Weight of enamel per sq ft.	.17 lb.	.17 lb.
Number of pieces per load.	10	14
Square feet per load	30	33.83
Square foot per hour	680	642.8
Total weight ware per hour	796 lbs.	752 lbs.
Power consumed	163.3 K.W. hrs.	170.6 K.W. hrs
Cost per K.W.H.	.0146	.0146
Cost per hour	$ 2.385	$ 2.49
Cost per square foot	.0035	.00388
Weight of ware per K.W.H.	4.87 lbs.	4.40 lbs.
Square feet work per square foot hearth area	17	16
Labor cost per hour	$ 1.70	$ 1.70
Labor cost per square foot	.0025	.00264
Operating cost per sq. ft...	.006	.00652

The highest quality of ware was obtained due to absence of gases and due to accurate temperature control. Unit cost of production is considered comparable to that obtained with oil fired furnaces, oil at 6¼c. per gallon, due particularly to the high production per unit floor space.

The furnace operates on a 60 cycle, 3 phase, 220 volt circuit, regulation being obtained by the use of auto transformers and a control panel automatically operated by indicating and recording controlling pyrometers from thermo couples located within the furnace chamber. The charts show the furnace chamber temperature at positions near the furnace door and also near the center. They show very well the small amount of necessary temperature variation which occurs during the baking cycle. Of course, the chamber temperature drops somewhat when the cold ware and racks are inserted and it rises to a maximum just before the new charge is inserted. This possible maximum is limited by the setting of the control pyrometer which determines the temperature at which the contactor panel cuts power off the furnace.

Heating Coils

The 24 heating coils in this furnace, each five feet long, eight inches wide of No. 1 Chromel wire, ten coils in roof and ten in floor and two in each side wall, containing about 250 lbs. total of metal, are distributed into two 3 phase control groups. The group covering the front half of the furnace takes a maximum of 94 kw. and the group covering the rear half, a maximum of 81 kw. making a total of 175 kw. maximum input to the furnace.

Unique Method of Lowering Steel Tank Into Pit

S. H. Excell, city superintendent of Vernon, B. C., submits the accompanying illustrations to indicate how a large steel tank was placed in the bottom of a pit without the use of derricks or tackle. The tank in question was made to serve as a reservoir for fuel in connection with a small Diesel engine driven electric generating plant. It was to be placed in the bottom of a concrete well or pit several feet below ground level. To accomplish this without the use of a derrick or other lifting tackle, the concree pit was filled with water and the steel tank simply rolled in. It naturally floated on the surface of the water which was then pumped out allowing the tank to settle to its proper location. This method proved both simple and expedient.



Fuel oil tank was lowered into pit without the use of a derrick by floating it and then pumping out the water

Compressed Air Solves Ice Problem

Submerged Jets Prevents Formation Against Gates—90 Pounds of Air Used—Good for Most Severe Weather*

In the final hours of the last day of June, 1913, the switches were thrown and current was turned into the wires radiating from the hydro-electric plant of the Mississippi River Power Company at Keokuk, Ia., and energy was then transmitted to St. Louis, 144 miles away. To achieve this splendid result, it has been necessary for the engineers to rear a great dam of concrete squarely across the path of the Mississippi. Including abutments, this structure has a total length of 4,649 feet, is 42 feet wide at the bottom, and 29 feet across at the top, and rises to a height of 53 feet above the rocky bed of the river. The dam is composed of 119 arched spans, with piers six feet thick, and with an open space of 30 feet between each pair of them. The spillway sections are each 30 feet long and 32 feet from end to end and eleven feet from top to bottom.

The dam, by impounding a portion of the Missippi's volume, was counted upon to form a lake above the dam which would reach up stream a distance of 65 miles, have a width of several miles at its widest part than a mile across where narrowest. By submerging the former rapids, this whole area would, of course, be a body of slow-moving and relatively still water. This lake, in other words, was to provide a favorable place, many square miles in extent, in which a great ice floe might develop and remain stationary until it melted away gradually with the coming of warmer weather. Up to a point, and for some time, these expectations were realized, but the confined ice was not as quiescent as the engineers had assumed it would be, and stresses were eventually induced by the ice which reacted injuriously against a number of the spillway gates.

Some relief, of a temporary character, was obtained by using steam to thaw narrow channels in



The spring break-up in front of cofferdam



Photo showing areas of ice free water produced by air jets. These are the dark patches. It was later found desirable to reduce their area

*From information supplied by F. A. McLean, Canadian Ingersoll Rand Company.

the ice parallel with and in front of each gate. This procedure proved to be a slow and an expensive one, and, withal, rather unsatisfactory because it was impossible with the equipment available to get around fast enough to take care of all of the 119 gates. Some of them were injured and badly bent before a pressure-relieving fissure could be melted in the ice by steam.

Before taking up in some detail the installation as it was eventually developed for the Keokuk dam, let us consider for the moment the conclusions reached by the management of the Keokuk plant after a period of experimenting. As they have expressed it: "Whatever method is used, it should not leave a continuous slot of open water above the dam which might allow the entire field to move suddenly against the dam, but it should clear the ice away from the gates and still leave it in contact with the piers. It is also desirable that the process be a continuous one, leaving no broken up ice, and be under the easy control of a minimum amount of labor."

After study and some tests, the engineers decided that subaqueous jets of compressed air could be used effectively to maintain a sufficient zone of open water immediately in front of each gate. It was satisfactorily demonstrated that the submerged discharge of air would induce a circulation of the adjacent water and that this movement, in its turn, would melt any ice present and thereafter check the reformation of it within a given radius—the latter depending upon the volume of air liberated. In principle, nothing could be simpler.

The system was put in operation December 10, 1917, and had at once to contend with a handicap of ten inches of ice on the lake. At the time, the average daily temperature was below 15 deg. F., and yet, within a week, the air was able to melt the ice away from substantially the full width of each gate and throughout a semi-circular area of considerable radius.

A motor-driven compressor located in the power house supplies air to a main extending on top of the dam from end to end. This main varies in diameter from 1½ to two inches, and is run close to the upstream edge of the structure. The piping has interposed in its length six expansion points which have a total traverse of 90 inches. Their function is to prevent the main from kinking.

Above the center of each spillway gate, the distributing main is tapped by a ⅜-inch pipe which extends downward and into the water. At each of these connections a ⅜-inch, needlepoint valve regulates the flow of the air through the small pipe.

With the pipe outlets eighteen feet under water and six feet in front of the gates, the emitted air caused a too general circulation of the water, and, as a consequence, the erosive action was so widespread that only thin ice formed about the piers where, for the reason already given, it was desirable that the ice be fairly solid in order to insure a good bearing of the field against the dam. Accordingly, the pipes were shortened to ten feet and adjusted so that they would discharge about a foot in front of each gate and six inches above the crest of the spillway. These alterations reduced the area of open water at each gate to two-thirds the width of that structure.



Upstream side of dam showing air-jet piping arranged to enter water six feet in front of gates

Perhaps it will be of interest to give further particulars about the compressed air equipment. On leaving the compressor, the air passes directly into a receiver, through the receiver, and thence by a 5-inch main, 250 feet long, to a second receiver. From the latter it travels through 350 feet of piping, of from four to five inchese in diameter, before arriving at the air drying apparatus. The aftercooler is capable of

removing, by condensation, approximately two-thirds of the moisture carried by the air.

On leaving the aftercooler, the air passes through a Mason pressure-regulating and reducing valve. This valve serves to dry the air still further and, at the same time, to insure a steady pressure in the distributing main on the dam. The drying of the air is promoted by a reduction of pressure while traversing the valve—this drop inducing condensation. A receiver, installed next to the regulating valve, collects the precipitated moisture. The receiver is insulated with three inches of corkboard, so that temperatures below that of the interior of the power house may be maintained. The piping from this receiver is insulated with 2-inch corkboard throughout its length until it pierces the wall of the building and reaches the open air.

The compressor, which is driven by a 100-h.p. induction motor, has a capacity of 520 cubic feet of air per minute. When in service, it runs at an average of 90 pounds gage pressure, and this is reduced to 70 pounds at the pressure-regulating valve on the dam main. As would be expected, the moisture-removing equipment has, under these conditions, been worked at only about two-thirds of its designed capacity, but, even so, the aftercooler, which has done practically all of this work, has kept the moisture content sufficiently low to obviate any freezing of the pipes. The installation was originally intended to operate at 125 pounds on the high side, but experience has disclosed that this would not be necessary.

In confirmation of the success of the compressed air installation for preventing ice pressure, Mr. C. A. Sears, the plant manager, declared in October of last year: "There has been no change in the procedure used in handling this problem from that given in our latest report. The last two winters have, however, been rather mild and at no time, have ice thicknesses exceeded nine or ten inches at the dam. Of course, this condition called for a much smaller amount of air to free the gates from pressure than would be required in a winter when ice thicknesses reached eighteen or twenty inches. I think it is now safe to say that about 120 cubic feet of air per minute is sufficient to relieve all gates of the dam from ice pressure even in the most severe weather."

Educating the Public

An educated public is generally well-disposed toward the utilities which serve it. This business of educating the public is expensive, however, so the public utility is often in the position of choosing between two evils. A plan that has been successfully used at a low cost by Montreal, Light Heat & Power Consolidated, is shown by the accompanying illustration. The attached letter from Louis Kon is self-explanatory:

"I enclose herewith a card which we have issued for the purpose of educating our clients how to check up the consumption of electricity and gas. Of course I do not mention anything as to waste of electricity being a firm believer that turning off light every time one leaves a room is not a desirable thing to do. The people at large are always looking for a home with plenty of windows to have as much daylight as possible; I do not believe that they should deprive themselves of artificial light after dusk particularly when the cost of current in consumption of lamps is so insignificant in comparison with expenditures for tobacco, candies, cosmetics, etc."

Voir texte français au verso, S. V. P. O-112

MONTREAL LIGHT, HEAT & POWER CONS.

LEARN TO READ YOUR METERS
IT IS SIMPLE AND WELL WORTH LEARNING.

Unlike any other firm you deal with, we place in your premises facilities to check the amount of your purchases, it is an open book in which your gas and electric accounts are kept.

Very few people remember how many lights have been burned or how long a gas stove or water heater has been used during a month or two, but the meter remembers.

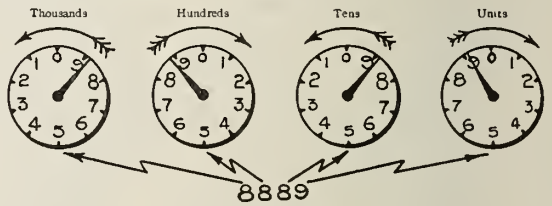
HOW TO READ YOUR METER

The dials represent units, tens, hundreds and thousands, just like columns in arithmetic.

The hands are operated by gears and move in the same direction as the figures count.

As soon as you begin to use gas or electric current, all hands start to move, each dial, beginning with the one on the right, adds its movement to the others.

In reading a meter, look first on the dial on the right hand side and set down the figure indicated by the pointer; if the pointer is between two figures, take the number that the pointer has just passed, then set down the tens column from the next dial to the left, the hundreds and so on until all the dials on the meter are read



Value of each unit figure:
Electricity: 1 kw. hr. (present net rate 4¼c)
Gas: 100 c.f. (present net rate 11c).

The difference between the readings taken at the beginning and at the end of any given period represents the amount of service or units used, and these, multiplied by the unit rate, will give the value in dollars and cents of service utilized.

Every meter before being placed in a customer's premises is inspected, tested for accuracy, approved and sealed by the Government of Canada.

TROUBLE—If you have trouble with your service, kindly remember that our Company is the proper place to register your complaint. We are always ready to help you

Waste of gas and electricity is the cause of big bills and of most complaints.
Don't use the gas oven to heat the kitchen.
Don't heat a kettle full of water when you need a quart.
Turn down the flame when boiling point is reached.
Keep gas range burners clean by washing them in hot water and soda at least once a month.
Satisfied customers are worth more to us than any revenue from wasted gas or electricity.

Montreal, July, 1923.

Hydro Report

The Hydro-electric Power Commission of the Province of Ontario have issued their 15th Annual Report which covers the year ended October 31, 1922. It is a most interesting volume of almost 700 pages including maps of the system.

New Type of Motor for Driving Pumps

Particularly Advantageous for Waterworks and Sewage Use on Account of the Superior Starting Characteristics—Cheaper Operating Cost of the Super-Synchronous Type

By L. F. ADAMS
Power and Mining Engineering Department, General Electric Co., Schenectady, N.Y.

While the induction motor has been and still is a very satisfactory motor for pump drive, it has one bad feature, that is, low power factor. This means extra losses incurred by transmitting the excitation to the load and extra investment in larger generators, transformers, and power lines to carry the excitation. Many of the power supply companies are now insisting that the power factor must be a certain amount and the power bill is increased if the power factor falls below this fixed value while on the other hand a bonus in some cases is given if the power factor is higher. One of the large companies furnishing power has a clause in its contract as follows:

"The rates set forth in the preceding tariff are based upon the maintenance by the consumer of an average power factor of 85 per cent for each month, as shown by integrating instruments. When the average monthly power factor is above or below 85 per cent, the kilowatt hours as metered, will, for billing purposes, be multiplied by the following constants."

Instead of giving a tabulation of constants I will interpret them with an example. If power factor is .5 the number of kilowatts billed will be about one-third larger than those actually metered, whereas if the power factor is unity, the number of kilowatts billed will be 5 per cent less than those actually metered. Under such contracts it is important to keep the power factor as high as possible. The same conditions exist and the same recommendations apply to those plants that generate their own power instead of buying it.

The power factor could be corrected by various means but wherever possible, it is better to avoid poor power factor by the use of synchronous motors.

Without going into details it is sufficient to say that the development through which the self-starting synchronous motor has passed during recent years has made this type of machine admirably suitable for constant speed pump drives. Especially is this true for the centrifugal pump, that is usually started with the discharge valve closed requiring usually not over 30% starting torque and 50 to 60% pull in torque. Motors for this service are designed to develop a starting torque of 50% of full load torque with the 70% compensator tap and pull in torque of 50% on the 70% compensator tap. Greater pull in torque will be obtained if full voltage is applied to the motor with the field switch open.

Starting Pumps With Synchronous Motors

In some applications it is desirable to start with the discharge valve open thereby requiring approximately full load pull in torque. In the past a magnetic clutch, which is expensive and requires considerable space, has been placed between the synchronous motor and the pump, and this made it possible to start the motor without load and then accelerate the pump by means of the clutch. However, synchronous motors are now built with adequate pull in torque and with such the magnetic clutch is no longer necessary.

Synchronous motors are also used for direct connection to reciprocating pumps. It is usually possible to place sufficient weight in the rotor of the synchronous unit so that no extra fly wheel is necessary. For such pumps full sized by-passes must be furnished in order to reduce the starting torque to a reasonable value.

The synchronous motor may be started either by hand or by remote or automatic control. The motor

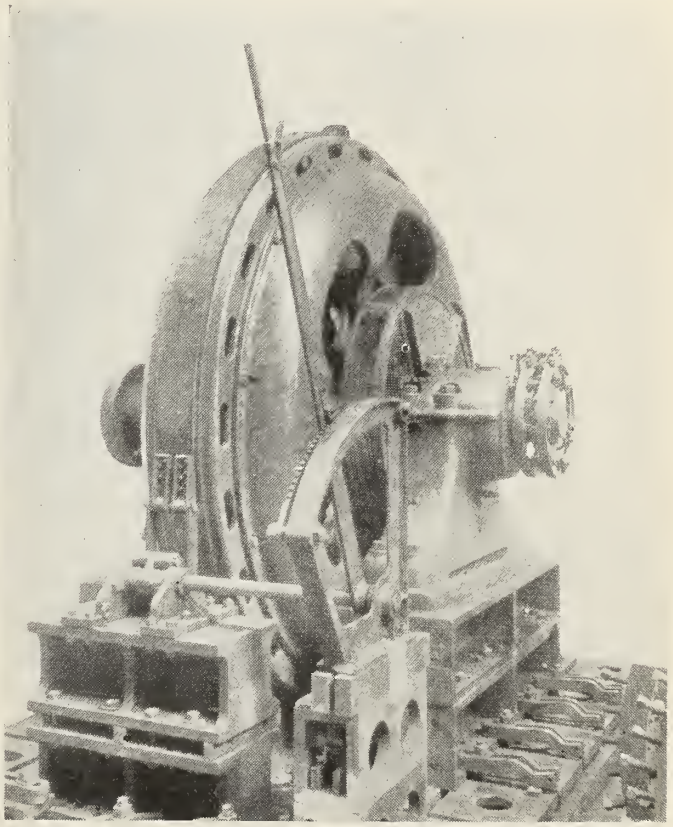


Fig. 1—A super-synchronous motor rated as 450 h. p. at 187.5 r. p. m.

may be designed for unity power factor or it may be made larger in order to give additional power factor correction thereby compensating for low power factor caused by induction in the station. Naturally the more correction desired the larger the motor and the greater the loss.

Because the induction motor could give very high starting torque it has been necessary to use it wherever the synchronous motor, because of its better power factor, would have been chosen if a high torque synchronous motor was available. A synchronous motor of special mechanical construction, which gives it a starting torque far in excess of any here-

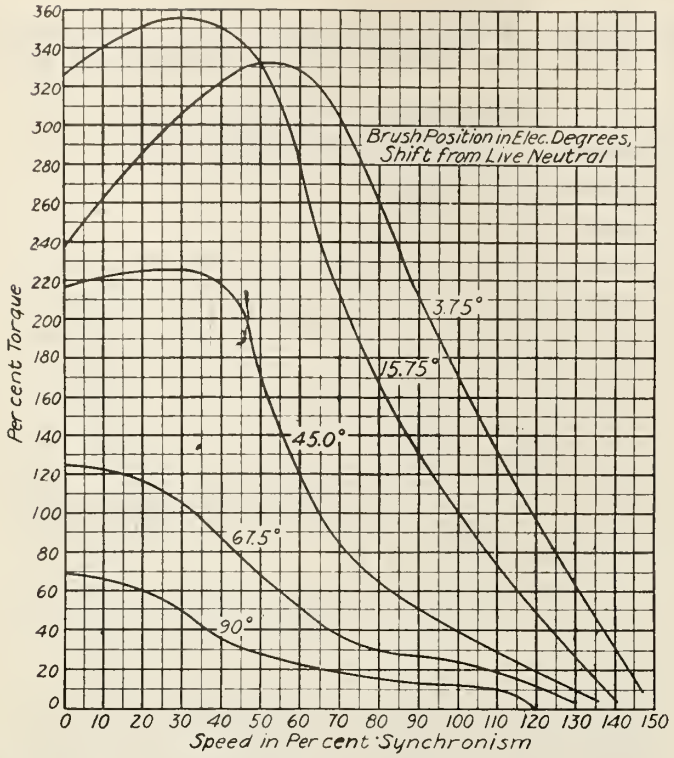


Fig. 3—Typical speed-torque curves of the brush-shifting motor for various positions of the brushes

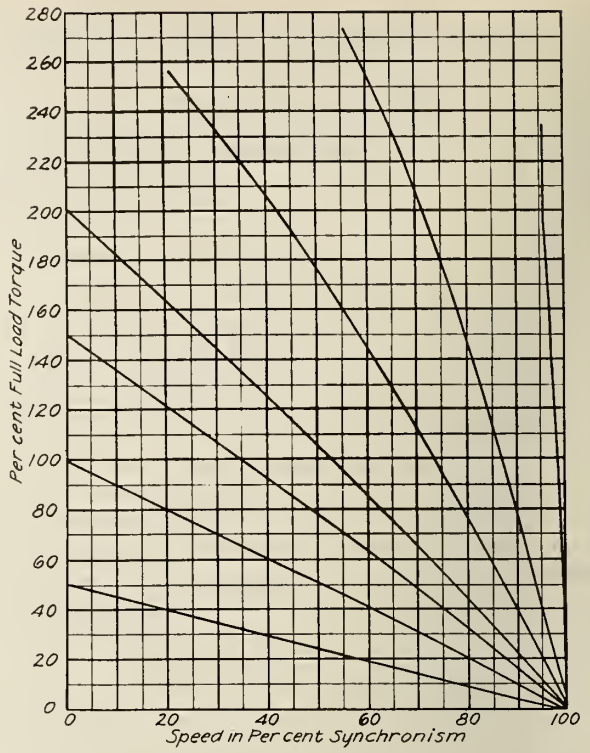
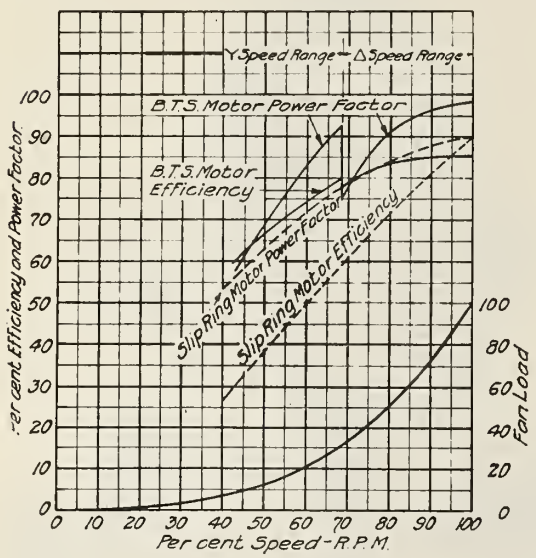


Fig. 4—Slip ring motor speed-torque curves with various amounts of resistance in the rotor circuit



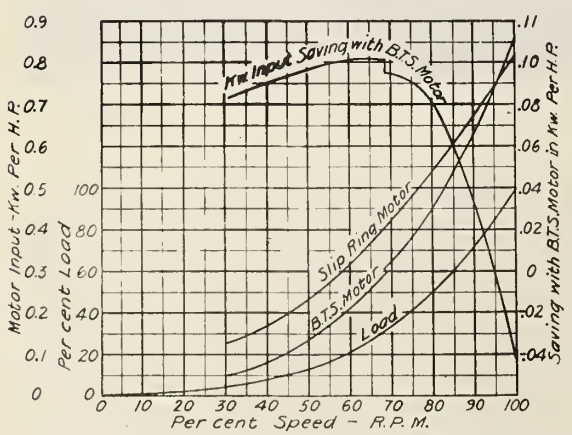


Fig. 5—Typical comparative efficiency and Power factor curves of BTS and slip ring motors under fan load

Fig. 6—Comparative kilowatt input per horsepower for BTS motors and slip ring motors driving a fan load

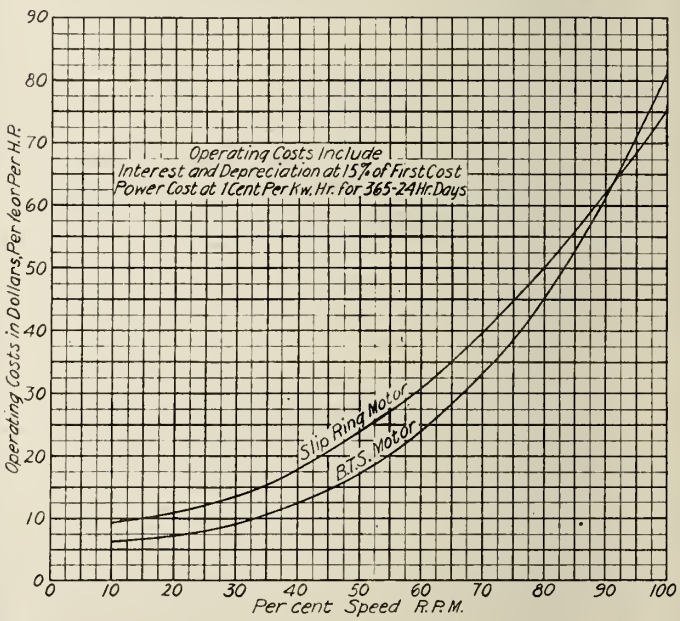
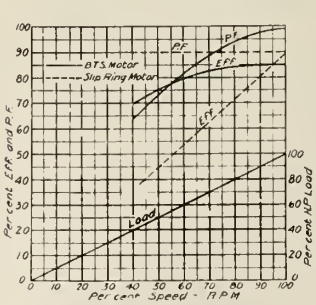


Fig. 7—Comparative operating costs for BTS motors and slip ring motors as affected by the operating speed



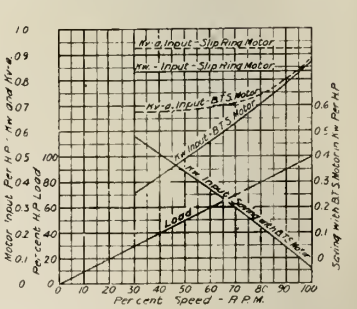


Fig. 8—Comparative efficiency and power factor of BTS motors and slip ring motors driving constant torque loads

Fig. 9—Comparative kilowatt and kilovolt input per horsepower for BTS motors and slip ring motors driving a constant torque load

tofore attained is now available and is particularly fitted for centrifugal and reciprocating pumps with discharge valve open or by-pass omitted, for air compressors omitting unloading values, vacuum pumps, etc.

New Motor For Pump Use

The electrical construction and essential dimensions of this motor are identical with the standard synchronous motor of the same rating. The special mechanical features (Fig. 1) include the suspension of the armature (starter) so that it can rotate during the starting period. Hollow journal extensions on the end shields are carried by bearings at the inner ends of the standards which carry the motor shaft. The periphery of the frame is machined for a braking surface and is fitted with the standard brake band lever and quadrant of mine hoist and cableway practice. The current is taken to the armature winding through rings which are normally stationary.

When starting with load, the brake is released, the armature is energized and comes up to induction motor speed. The field (rotor is then energized and the armature comes to synchronous speed. Now by applying the brake the armature can be slowed down which results in the starting and speeding up of the field and attached load. The acceleration proceeds to synchronism proportionally as the armature is brought to rest. The brake is locked and the unit has become a normal synchronous motor.

Throughout the acceleration of the field from zero to synchronism the motor is able to apply torque to the connected load several times greater than its normal full load torque.

The current drawn during starting bears the same relation to the full load current as the starting torque required bears to the full load torque. That is, a starting torque of 125% full load torque will draw 125 per cent of full load current from the line.

Heretofore, when synchronous motors have been connected to loads that could not be relieved during starting it has been necessary to interpose two extra bearings and a clutch of some sort that would allow the motor to come up to synchronous speed while disconnected (Fig. 2). The cost of these extra fittings, their weight, the careful alignment required for a four-bearing set and the extra room taken up, have been serious handicaps working against the use of this otherwise very desirable type of motor.

The designer being freed from the consideration of starting torque can accentuate the other desirable motor characteristics and can secure the desired rating in smaller dimensions.

There is a progressive practice in electric drives tending to reduce motor speeds in order to do away with part or all of the speed reducing devices heretofore employed. This tendency toward lower speeds makes induction motors less and less desirable because of the greatly reduced power-factor and efficiency. The efficiency and power-factor of the super-synchronous motor compares with like characteristicc of an induction motor as follows:

RATING 450 h. p., 187 r. p. m., 2200 volt

Super-synchronous motor		Induction Motor
93.5 per cent	Efficiency	89.9 per cent
Unity	Power-Factor	70 per cent

Both the synchronous and super-synchronous types of motors are constant speed motors. Some times, however, it is desirable and necessary to use vary speed pumps requiring varying speed motor. In the past the slip ring induction motor with secondary resistance control through a limited number of steps resulting in considerable loss of energy has been the only alternating current motor available. The demand for a motor having speed regulation over a wide range with small increments and with good efficiency over this speed range led to the development of the adjustable varying speed, brush shifting, single-phase and polyphase motors.

The motor consists of a stationary member or stator, a rotating member or rotor, and a transformer connecting the rotor in series with the stator.

The stator has distributed winding and is similar to that of the ordinary induction motor. The stator of an induction motor having the same number of poles, horsepower, voltage and frequency can be used without change for numerous ratings.

The rotor is in appearance and design essentially like that of a direct-current motor or generator, except that the armature voltage is considerably lower.

The rotor transformer is simply a series transformer with the primary in series with the stator of the motor and the secondary connected to the rotor

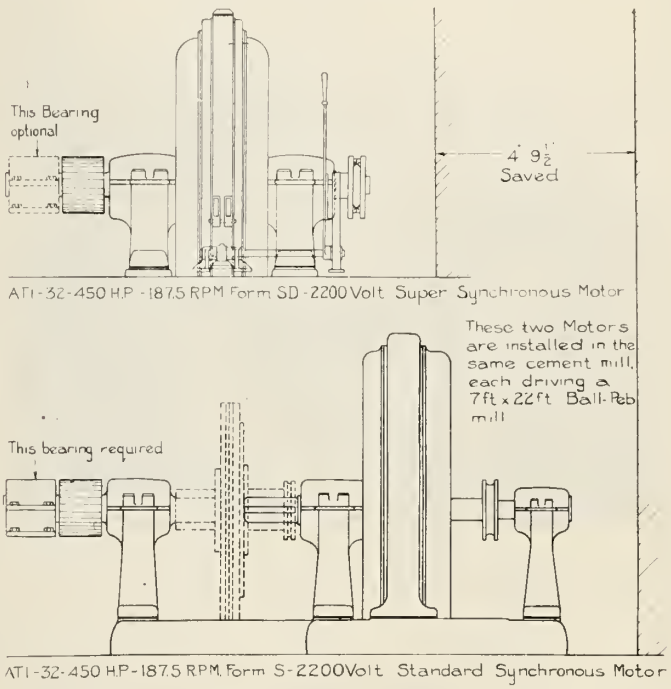


Fig. 2—The relative overall lengths of the super synchronous motor and the standard synchronous motor with the extra bearings and clutch necessary for any but the lightest starting duty

through the brushes and commutator. This transformer not only supplies a lower commutator voltage but by its ability to become saturated limits the no load speed of the motor to a safe value. This limit is approximately 150 per cent speed.

The change in speed is obtained by shifting the brushes. In a certain brush position the fluxes from the stator and rotor so combine that no torque is produced. Shifting the brush position slightly, results in a torque- producing flux, which causes rotation. As the shift is increased the resulting torque-producing flux continues to enlarge and the speed becomes higher.

The maximum capacity for which these motors can be built is limited by commutating conditions. It has been found by experience that a limit of 30 h.p. per pole for 60 cycle motors and 70 h.p. per pole for 25-cycle motors may be used for rough approximations. This rule of thumb gives a limit of about

175 h.p. for 1,200 r.p.m. motors and 350 h.p. for 600 r.p.m. motors.

Comparative Characteristics

The speed torque curves of Fig. 3 show that the characteristics of this motor compare favorably with those of slip ring induction motors having secondary resistance control (Fig. 4). Wherever a slip ring induction motor is applicable for adjustable varying speed service the brush shifting motor may be applied, and in addition to having similar series characteristics it provides an infinite number of speed points. For centrifugal pumps, fans, etc., where the torque decreases rapidly with the speed, stable conditions exist at all speeds practically down to standstill.

Typical comparative efficiency and power factor curves for the brush shifting and slip ring motors when driving a fan load or similar loads such as pumps are given in fig.5. One hundred per cent speed for the brush shifting motor is equal to 12½ per cent above synchronism, while for the induction motor it equals full load speed, which is approximately 96

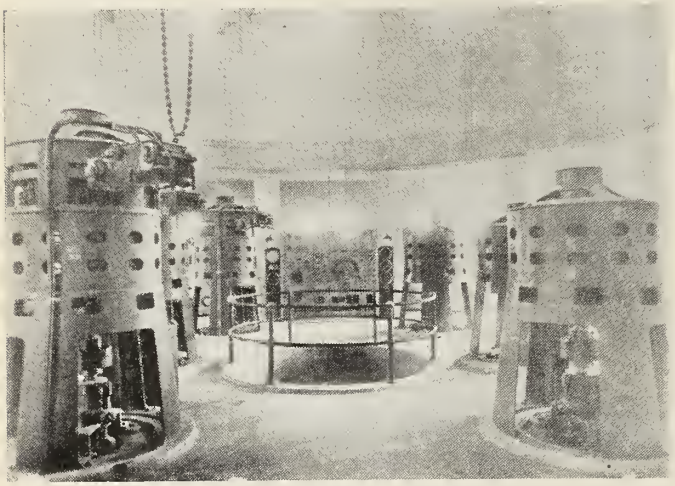


Fig. 10—Three 150 h.p., 480 r.p.m., 2200 volt, varying-speed brush-shifting motors and three 100 h.p., 400 r.p.m., 2200 volt, constant-speed squirrel cage motors with master control panel. Sewage pumping plant, Albany, N.Y.

per cent of synchronism. This comparison assumes that the motors are driving equal loads but that the machine for the slip ring motor is designed for a slightly lower speed. At 100 per cent speed the slip ring motor efficiency is slightly higher but as the speed decreases the loss in the secondary resistors causes the efficiency to drop off rapidly.

The break in the curves is due to changing the motor connections from delta to Y. Changing to the Y-connection is equivalent to a voltage reduction, and, as is evidenced by the great increase in power factor, results in decreasing the magnetizing current. In most cases, for loads of this kind the change-over should be at 70 per cent speed . When this change is made a different speed is obtained for the same brush setting.

The benefit of this higher efficiency is more clearly shown by Fig. 6 which gives the comparative kilowatt input per horsepower when operating at different speeds. The saving in kilowatt input per horsepower by using the brush shifting motor instead of the slip ring induction motor is also shown. If the motors in question are 100 h.p. the kilowatt saving (Fig. 6) at 75 per cent will equal 100 x 0.01, or 9.1 kilowatts. The saving per year at this speed, assuming 365 twenty-four hour days (8,760 hrs.), will be 79,700 kw.h.

By estimating in detail the operating speed cycle that is required a more representative power saving may be calculated as follows: Assume a 100 h.p. fan unit having a speed cycle of operation each day equivalent to:

4 hours run at 100 per cent speed
8 hours run at 85 per cent speed
8 hours run at 65 per cent speed
4 huors run at 60 per cent speed

From Fig. 6:

Hours	% Speed		Kw.-hrs.
4	100	4 x 100 x .045=	18.0 loss
8	85	8 x 100 x .058=	46.4 saving
8	65	8 x 100 x .102=	81.6 saving
4	50	4 x 100 x .095=	38.0 saving

Total kw-hrs. saved per day 148.0
Total kw-hrs. saved per day 54,000

Large Savings

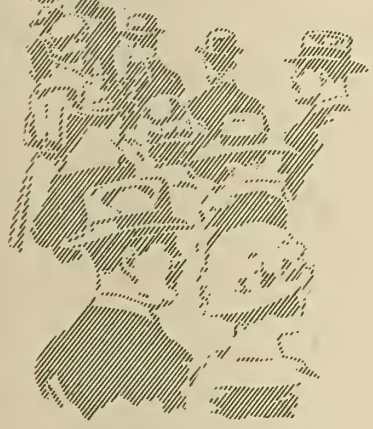
At one cent per kw.h. this equals a saving of $540 per year, which capitalized at 15 per cent for interest and depreciation, etc., justifies an additional expenditure of $3,600 for the BTS equipment. This is a conservative estimate, for in the majority of cases the cost of power exceeds one cent per kw.h.; but even so the additional expenditure that is justified would practically cover the complete charge for a new motor and therefore warrant the use of the brush shifting equipment even though the slip ring motor could be obtained for nothing.

The importance of this increased efficiency for varying speed, fan drive, or similar drives is further illustrated by Fig. 7, where the operating cost per horsepower per year is plotted against speed. This operating cost includes interest on the capital investment and depreciation at 15 per cent, and a power charge of one cent per kw.h. input. This shows that above 91½ per cent speed the BTS motor is generally more expensive, but for operation at any speed below this it is by far the cheaper equipment. Assume for example a 100-h.p. motor operating continuously at 70 per cent speed. The operating cost per horsepower per year for the slip ring motor is $39.60 and for the BTS motor $33.50. Therefore, with a 100 h.p. motor there would be a saving of $610 per year and at the end of six years the BTS motor would have paid for itself.

For loads requiring constant torque throughout the entire speed range the BTS motor is even more desirable as is shown by the curves of Fig 8 and 9. At 70 per cent speed (Fig 9) the saving is 0.2 kw. per horsepower as compared with 0.092 kw. per horsepower with a fan load (Fig 6). It will be noted that with a slip ring motor driving a constant torque load the input remains constant for all speeds, while the horsepower output decreases directly with the speed.

While the brush shifting motor has finer speed control and better efficiency when operated at reduced speeds it does not follow that it is better than the slip ring induction motor for all applications. If only 10% speed reduction is required for a short time during the day then unquestionably the slip ring induction motor will show up better than the brush shifting motor. However, this type of motor for varying speed drives, and the synchronous and super-synchronous types of motors for constant speed drives must be given careful attention in considering power drives for water and sewage pumps as well as other applications.

How to Increase Your Xmas Sales of Electrical Goods





CHRISTMAS selling makes a hump on the sales curve like the pack on Santy's back. In six short, sweet weeks the merchant can lay up a golden gift of rich profits for himself. It has been proved that Christmas sales of electrical goods can be boosted to equal 25% of the year's turnover.

This coming season will beat anything we have had before. Every year brings more purchasers of electrical gifts, every year brings the merchant more gift appliances to sell. People will pass your store wondering what to buy. If you tell them, you sell them. Use the idea of this special section of Electrical News, and fill your store with a flock of glad buyers.

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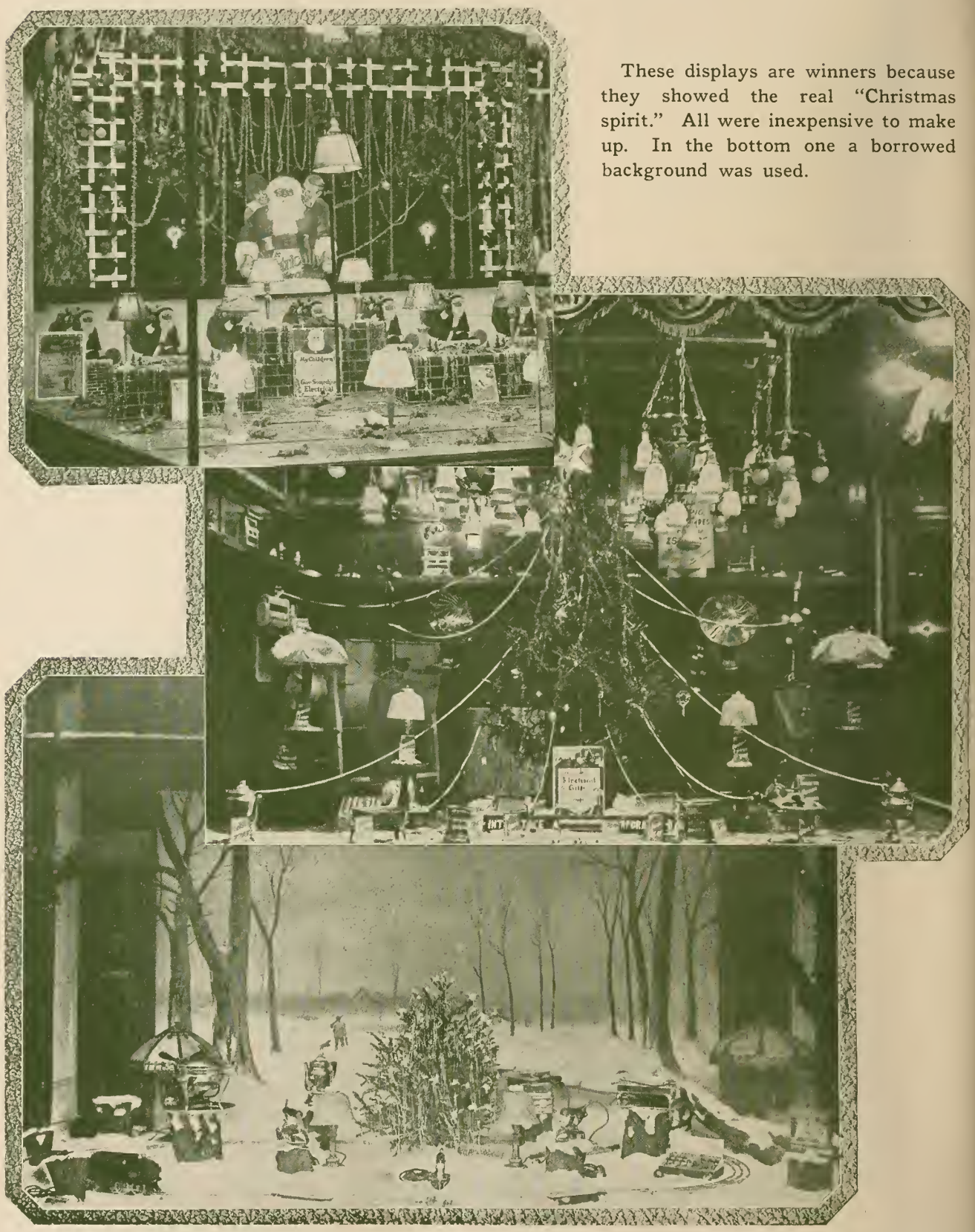
Electrical News

Engineering Contracting | Merchandising Transportation

Toronto, October 15th, 1923

Business Getting Christmas Windows

Some of Last Year's Top Notchers



These displays are winners because they showed the real "Christmas spirit." All were inexpensive to make up. In the bottom one a borrowed background was used.

—Cut by courtesy of "Contact"

Santy's Coming!



Are You Ready?

Let Him Help You Stage a Real Gift Festival in Your Store

Gift business is nice business. Easy to handle, good profits, few comebacks. We all want it. We ought to get it because there's nothing to stop us, except inertia. The suggestions that follow are tested from past experience. They show how we can get more people to buy electrical gifts.

Two Inch Space in the Newspaper

First, it is necessary to make a very definite appeal to the public along this line. Let them know that you can meet their special requirements. A two-inch, column wide ad, in your local newspaper, will carry the message, if you can't spend more. Demand a good position for the ad, and before you write your copy, put yourself in the place of the man who is to read it.

Is Your Window a Non-Combatant?

Our next firing-line unit is the display window. Do we give enough attention to this trusty salesman of ours? The echoes answer "No!" If our readers will excuse a pun, it may be said that the window often gets a "dirty" deal. To attract Christmas shoppers in particular, it must **sparkle**, and have a Christmassy look that says "Here is the place to buy electrical gifts." However, window dressing for Christmas is a subject worthy of an article by itself.

Get in Line

It will be wise to identify yourself with the great body of merchants in every line who will be making a feature of gift merchandise for several weeks before Christmas. Get in on the "Do your Christmas Shopping Early" campaign in your town, if such a campaign is originated, and if there isn't, then start one yourself. Propaganda which has been issued in recent years has been quite effective in alleviating the pre-Christmas rush, and has thus benefitted everyone concerned. The merchant has been able to spread the extra business over a longer period and thus avoid in many cases the hiring of extra help; the salespeople have not been forced to work long hours at such high pressure, and the public have been doing their shopping in much greater comfort with less waste of time. There is little doubt, too, that the results have also been shown in a general increase of Christmas trade.

Gift Selections of Electrical Goods

It is useless to bid for the gift business if you have not the right kind of goods. Analyze your stock and make a list of all the lines that would make appropriate gifts. Then you are in a position to go ahead and work out a suitable campaign.

People really don't appreciate that there are many delightful and useful electrical gifts. It is up to the dealer to enlighten them. The list of suggestions which is printed elsewhere, and the various articles illustrated, will help you to make a selection.

Why Not a Special Department?

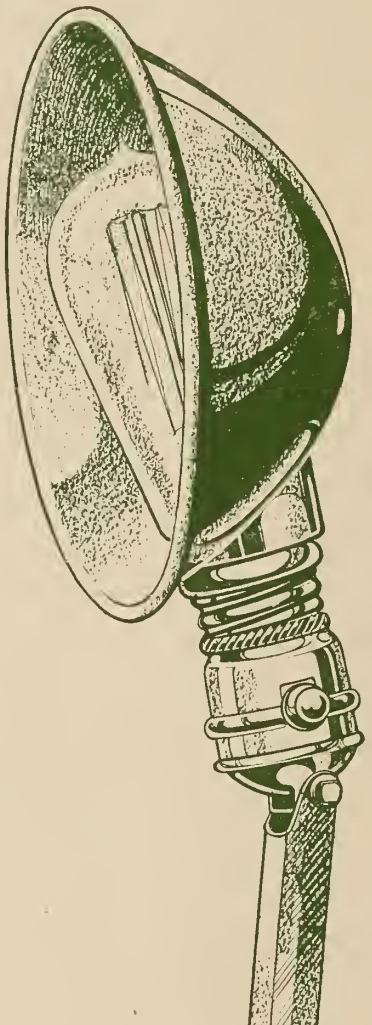
If you have room, even for a fair-sized table, you can arrange a "Gift Department," that will draw business. Get together all the lines that will be featured in your Christmas window display and advertising. You will find this collection a centre of interest for shoppers. They see a number of handsome appliances, each bearing an appropriate greeting card, and the display does not fail to register.

YOU GET OVER 50% PROFIT ON EVERY

The Banfield ADJUSTABLE-LITE

CLAMP IT-HANG IT-STAND IT-ANYWHERE

The Banfield "Adjustable-Lite" has a silver lined Reflector which gives better light and throws a strong beam of "light where you want it".



YOU can sell a lot of these handy lamps in the next few weeks—especially to Christmas gift-purchasers. Every home—every man and woman—needs one or two.

The Banfield "Adjustable-Lite" is the best lamp of its type made. It has many improvements—many exclusive features. Note, too, that the upright post and clamp of the Banfield "Adjustable-Lite" are securely RIVETTED together. They cannot work loose. It is the handy lamp with the handy socket—the lamp of a hundred uses, and a thousand comforts. Made wholly in Canada by lighting fixture craftsmen. Make it a leader in your order for Christmas Trade.



Sell only the Lamp with the "LEVOLIER" Socket

The Approved 660 Watt Type.

It costs no more and you know it is a better socket. Simply move the knob in any direction—up, down, sideways. One push lights, another puts the light out. The handiest, safest—the ideal socket for a portable lamp. Only found on the Banfield "Adjustable-Lite".

Adjustable-Lites are packed in striking individual cartons, lithographed in five colors. They make attractive displays and increase sales.

ORDER FROM YOUR JOBBER.

Produced in Canada by

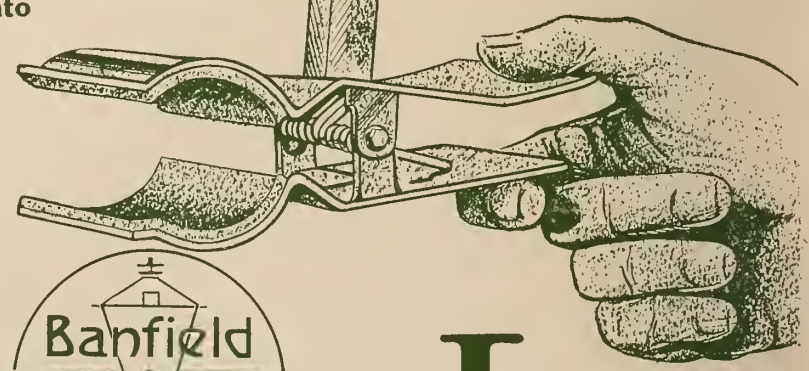
W. H. Banfield & Sons Ltd.

370-386 Pape Ave., Toronto

Retail Prices

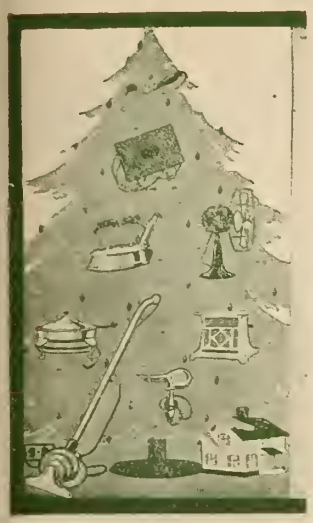
Brushed Brass	$5.00
Bronze or Nickel	5.50

Prices are 25c. additional in Maritimes and B. C.



The Banfield ADJUSTABLE-LITE

CLAMP IT-HANG IT-STAND IT-ANYWHERE







16 Proved Ideas

Brain Waves for Christmas Campaigns

A successful plan used by several dealers last year for the holiday season consisted of giving a Christmas card with every article sold. The cards were of good design and quality and there was such a selection that customers did not hesitate to use them with the gifts. The cards were signed and enclosed in the package. The dealers who used this plan report that it was an excellent builder of good-will, many customers remarking that it was "such a convenence to have the card right with the appliance."

Mail Gifts for Your Customers

Just to show that the electrical store is as up-to-date in business matters as any of the most highly organized department emporiums, we give an example of how one dealer is planning this year to extend a mailing service to buyers of Christmas gifts. He advertises and makes it known as well by direct mail and window show cards, that he will wrap, stamp and mail any article carried in his stock free of charge, if the same is destined to be a Christmas gift. This idea will be emphasized in his window by the display of a package done up in holiday fashion with red string and holiday sticker, and a showcard telling that this service is available to all customers.

Win the Children, and the Parents are Yours

A lot of us are so deeply immersed in the heavy side of the merchandising game that we are apt to forget that the electrical business has a lighter side as well. This lighter side is represented by the fine selection of electrical toys that is now available to the electrical dealer. A glance at the pages of illustrations of Christmas gifts in this issue will give many tips. The dealer that decides to carry toys can make a very profitable specialty of them. Arrange a special electric toy department in the front of your store. The kiddies of your neighborhood will very soon get to know of it and the fascination which it exerts will induce them to bring heir parents in. Besides selling a profitable amount of electrical toys you will also interest the parents in the other goods you have on sale. The toy department adds a "human interest" touch to the electrical store and this, combined with the Christmas decorations, makes it seem a real place to buy Christmas gifts.

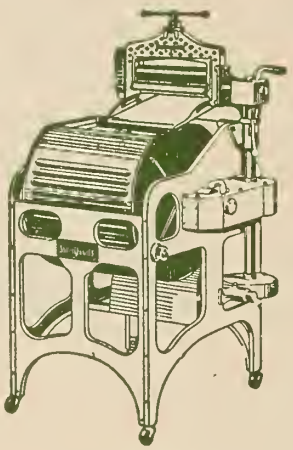
Meeting the Cautious Buyer

A large class of people hesitate to buy Christmas gifts unless they are sure that the recipient can change them if they are not suitable. A good way to attract these people is to let them know that you will take back for exchange anything that may be duplicated, or which for some other reason, it is desired to change. Of course, a time limit must be set but the scheme is very practical and adds many a dollar to the Christmas turnover.

The Gift Certificate

Every year the custom of giving money, or something that denotes money value, is becoming more marked. People who give in this manner are then sure that the recipient is free to choose whatever gift he may desire. You will note that many of the larger stores in every class of business in the community are adopting this idea in their Christmas advertising. It is a good plan to fall in with. Announce that you are able to give gift certificates which mean that the person named on the certificate can choose whatever particular article he may desire. This plan is often made use of by those who know that an individual may want an article but are

Climbing Sales Prove Its Worth



One of the reasons for Sunnysuds' success. It is equipped with safety switch which automatically prevents overloading and blowing fuses.

The Sunnysuds Washer Broke All Sales Records in the Last Three Years

Today Sunnysuds ranks with the leaders in the household appliance field. It has established an enviable reputation among trade and public alike. And the next three years bid fair to eclipse the others. Everybody likes a winner, and nearly all territories are taken, but there are still a few left. If you want to cash in on this business with the Sunnysuds agency for your district, write us today, and we'll be pleased to tell you all about it.

Onward Manufacturing Company, Kitchener, Ont.



EUREKA

ELECTRIC VACUUM CLEANER

Mr. Dealer! Are you looking for an electric vacuum cleaner agency that will yield big profits, bring in steady trade and make new friends for your store? That's what the Eureka is doing for merchants all over Canada. It has proved its superiority by direct comparison at the world's fairs. It is being bought by thousands weekly in preference to all other makes. Not only because the Eureka is the best vacuum cleaner, but because a nation-wide advertising campaign keeps telling the public—your prospects—why it is the best. This means big business for dealers who carry them. Why not drop us a line and get our proposition?

Eureka Vacuum Cleaner Co.

KITCHENER, ONTARIO

Let's All Pull Together for a Real Electrical Christmas!

not sure as to the particular size or brand desired. The plan relieves them of the necessity of choosing and there are always many who are glad to avail themselves of it.

Electric Christmas Trees

We find that several enterprising dealers are making a point of going after the electric lighted Christmas tree business. It is true that each job is a small proposition by itself, but the point is to do the jobs so well that you get a reputation for it and have all this kind of business you possibly can handle during the season. It is the sort of job that the proprietor can secure himself in a short interview and then have the work done by a subordinate. It is found that churches and other organizations which have Christmas trees for the benefit of a large number of children, are specially good customers for this work. Besides wiring for the Christmas tree, there is often opened up a chance to improve the illumination on the stage where concerts may be given, or perhaps to supply an electric heater for a cold dressing room or other small room which is seldom used in the winter at Christmas time.

That Christmassy Feeling

The idea that the electrical store has to don special attire for the Christmas season is one that must be absorbed if the dealer wishes to do his share of Christmas business. Christmas buyers look for that sort of stuff and their conclusion is that if they do not see it, the store is not headquarters for Christmas gifts. You can hardly make the message



Start early for a good finish!

too strong. If you can get an electric sign to hang out over the sidewalk reading "Electric Christmas Gifts" that is a good beginning. Another one across the window should point out your store as the logical location. It should carry some such wording as 'Headquarters for Electrical Christmas Gifts." Inside the window there should also be a further rendering of the message. Some of the cards which are printed elsewhere in this issue give an idea of what is required. If you have room inside the store for



There is more than one way to get business

large signs, it is quite profitable to use them. Make your principal messages "Give Something Electrical" and "Say 'Merry Christmas' Electrically." Just a word about the makeup of these signs. When ordering them remember that if care is taken they will do for future years as well, and that for such a permanent thing it is well to go to a reasonable expense. Have your signs painted by a good man and you will find that your expenditure is well repaid.

Looking Ahead

The dealer can easily tell whether things that are bought are intended to be Christmas gifts for someone. In case your observation leads you to the conclusion that the appliance is to be a gift, it is a good plan to suggest that after Christmas the recipient might appreciate a call from you when you could explain exactly the working of the appliance and see that it is performing satisfactorily. Very often this will get you the name of the person to whom the appliance is to be presented, and you will get a goodly number of names and addresses representing people who are likely to be good prospects for other appliances in the days that follow Christmas season.

Let us suppose as well that the names of the people who buy are equally desirable. Christmas is a busy time but it certainly pays to get a list of your customers and know where they are located. Even if you do not intend to do any direct mail work, you will probably get to know what streets are best to advertise with dodgers and so on, and you are able to perhaps call on two or three people in one trip and secure business.



Christmas Spirit Makes Christmas Sales

Get the Christmas spirit and pass it on to your customers. Decorate—talk—advertise Christmas—keep it fresh in the minds of your prospects. Inspire them with the spirit of the season—to give—to make happy.

Let your slogan: "Electrical Gifts are Worth While" be an answer ot the ever-present question, "What Shall I Give?" Westinghouse electrical gifts are extremely popular. They are beautiful and useful—lasting and worth-while gifts.

Santa Claus is a high-powered salesman. Boost his game and increase your sales. Sell Westinghouse Electrical Appliances and have a Merry Christmas.

Canadian Westinghouse Co., Ltd.
Hamilton, Ontario

TORONTO, Bank of Hamilton Bldg.
HALIFAX 105 Hollis St.
CALGARY, Canada Life Bldg.
MONTREAL, 285 Beaver Hall Hill
FT. WILLIAM, Cuthbertson Block
VANCOUVER, Bank of Ottawa Bldg.
WINNIPEG, 158 Portage Ave. E.
EDMONTON, 211 McLeod Bldg.
OTTAWA, Ahearn & Soper, Ltd.

Repair Shops
MONTREAL, 512 William St.
WINNIPEG, 158 Portage Ave., E.
VANCOUVER, 1090 Mainland St.
TORONTO, 366 Adelaide St. W.
CALGARY, 320 8th Avenue West

Westinghouse

Have You Seen the 13 Window Trims Illustrated or Described in this Issue?

The Cinema Slide

In the smaller places it has been found that the use of colored lantern slides in the local motion picture theatres gives good results. It pays to have the slides well made and they should have a Christmas atmosphere. One slide that looked very well last year showed a conventional Santa Claus with the wording "John B. Peckham—Headquarters for Electrical Gifts—See our Special Display."

The Christmas Tree Truck

There is an old stunt that has been in use so long one would think that practically every progressive dealer would use it. The stunt is good but so far as we know, there is only an odd one here and there that takes the trouble to do it. It consists in buying a small Christmas tree—a real one—and fixing it upright in the delivery truck. A sign is attached telling the Christmas buyers that at Johnson's store is the very best place to buy electrical Christmas gifts. The owner puts the tree on the truck early in the season and wherever it goes about the city on any jobs, delivering, or whatever else it may be, there goes the tree with the sign attached. There is not the least doubt that this device has attracted a good deal of attention and one dealer claims that besides results which he could not definitely trace, there were many customers who came in and stated that they were attracted by the novelty of the idea. Of course, if everybody uses it, it won't be a novelty any more, but it is worth a trial anyhow.

A Christmas Contest

Last year, Electrical News received an interesting account of how one wide-awake dealer carried out an essay contest among the school children of the neighborhood. He happened to have available the services of the staff of a weekly newspaper in which he did considerable advertising, and these folk cooperated with him to the extent of acting as judges on the essays and giving the contest considerable free publicity in their paper. The contest was announced quite early in the season and there were, of course, several conditions as to age and place of residence of the participants. The plan worked out well.

Use the Rubber Stamp

Have a rubber stamp made bearing the words "Give electrical Christmas gifts—buy them at Jones' Store." Arrange with a nearby news agent to let you stamp every paper and magazine he has in stock with this stamp. This spreads the idea to everybody that buys a newspaper or magazine and such wide-spread publicity is bound to secure results. It is true that the stamping requires considerable time and it is likely that you can only attempt it once.



Window cards with the right touch

There's an Electric Washer to Suit Every Prospect in the Famous Connor Line



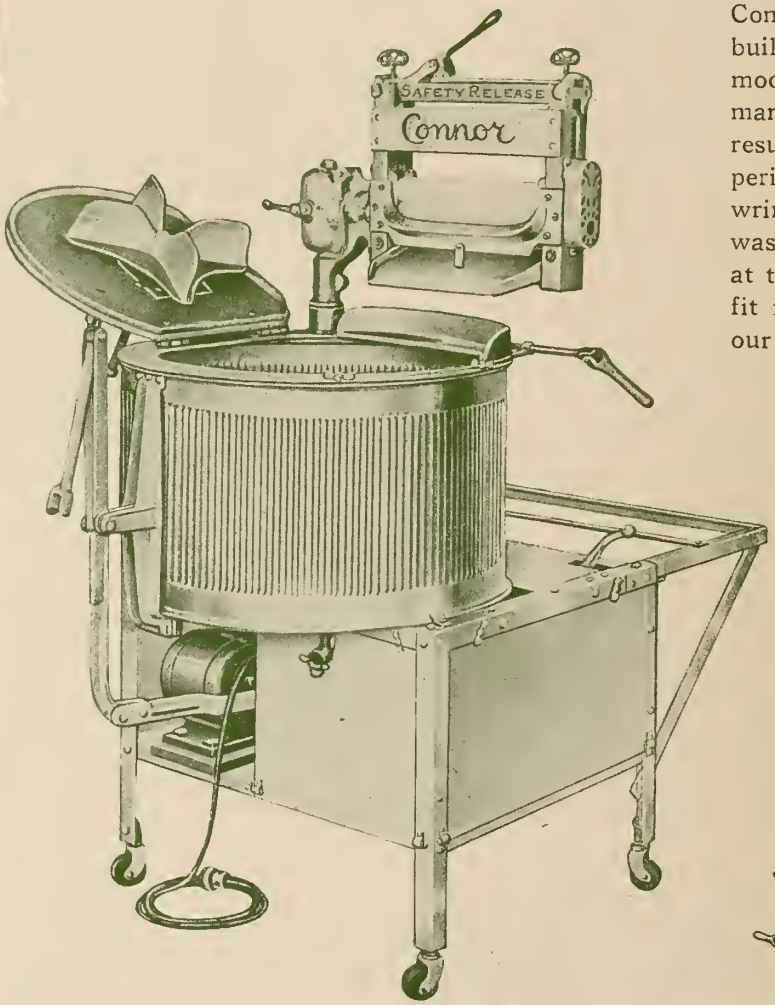
Connor Perfection Electric Swinging Wringer

Connor Electric Washers built in four different models, meet every demand. They are the result of long years of experience in washer and wringer building. Every washer guaranteed. Look at the prices, a good profit for dealer shown, get our trade discounts.

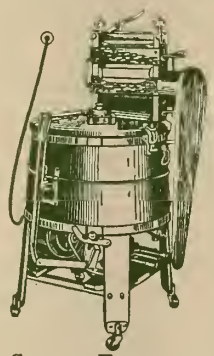
See This New One

MODEL 4C

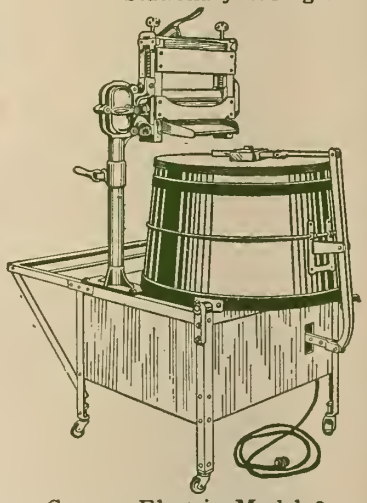
This latest addition to our line is filling a long-felt want. It possesses many special features—polished copper tub and polished aluminum cover, polished aluminum feed board and drain board of 12" swinging wringer, extension folding bench —these and many other special devices make an instant appeal.



The Connor Copper Tub Model 4C



Connor Economy Stationary Wringer



Connor Electric Model 2 Wood Tilting Tub Swinging Wringer

Mr. Dealer-- Ninety-Five out of One Hundred women you talk to, in your store or through your ads., use the dolly type hand or water power washer. When you show them the Connor four winged dolly, they know, from experience, you are right. Why not recognize the advantages of our four, different, models operating on same principle, meeting the buying ability of different people.

J. H. Connor & Son Ltd., Ottawa, Ont.

311 Chambers St., Winnipeg, Man.

Christmas Selling Offers Special Opportunities for Radio and Washers

However, the plan is worth trying. Mr. Newsdealer may not be quite favorable, but he may be won over with the gift of some electrical device. The rubber stamp comes in useful in stamping the literature received from manufacturers. That is, on all goods that do not bear the dealer's name, the rubber stamp should be used and the booklets distributed in your neighborhood. This advertising perhaps does not carry a direct selling message, but there can be not the least doubt that it directs the eye of the public to your store as a place for purchasing Christmas gifts.

Help People Choose

People are inherently lazy and the more you do for them the more they are inclined to buy in your store. Following out this idea, a good plan is to label the various appliances in such a way as to indicate for whom they are the most suitable gifts. This may be accomplished by placing near each article in your window display, a small card bearing the words "For Mother," "For Father," "For Sister," and so on. Some dealers make a good deal more of it than this, by pasting the cards on the glass of the window (inside) and run streamers back to the their imaginations working. They picture so-and-so article mentioned. People like this because it starts in the possession of such an article and if there is the least glimmer or intention on their part to give such an article, the window display, the appearance of your store, and the little show card, fan it into action.

Supplies for Window Decorating

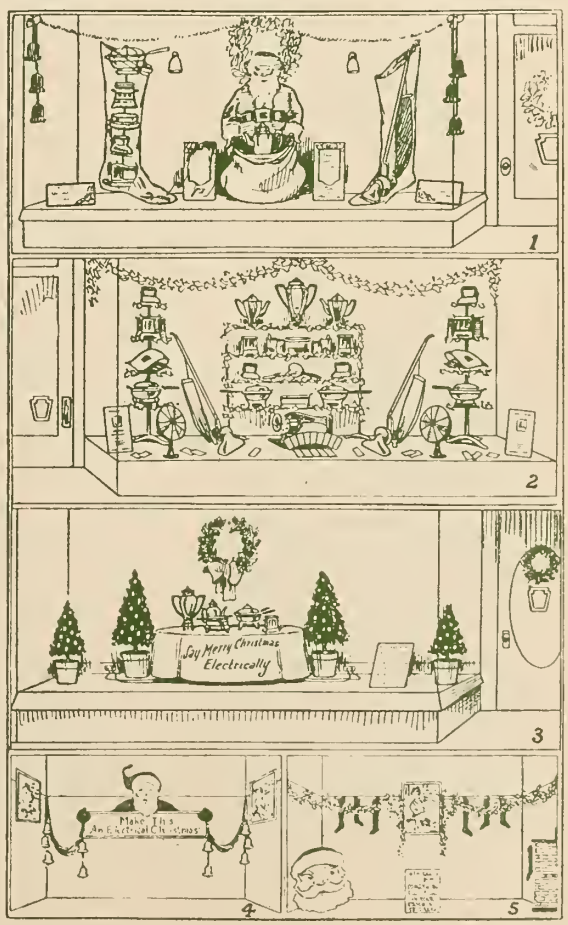
It is just as well now to check over your stock of window dressing appliances and make sure that you have on hand sufficient materials to give your window a real holiday appearance. You will need holly, tinsel, tissue paper bells, small Christmas trees, Santa Claus figures or cut-outs, artificial snow, sparkling ornaments, small fire-place with stockings. If you can get hold of a wax figure and a table you are in luck, because you can stage a real Christmas morning tableau that will draw the crowds to your window. With the conventional Christmas trimmings, fireplace, table and, if possible, the wax figure, the essentials of the scene are at hand and you can make a dandy window.

A Guaranteed Winner

The idea of displaying appliances with a marked price has been found to be of real sales value. An excellent way to do this is to group a number of electrical items on a table with one big sign reading, for example, "Electrical Christmas Gifts At Less Than $5.00." It is easily seen that this classification might include a large variety of equipment such as irons, small lamps, curling irons, flash-lights, and so on. It drives home to the public the fact that there are many beautiful electrical gifts at very low prices.

Novelties Will Help Christmas Atmosphere

More and more it has become evident that something of a novel bright nature will help the rather cold air that somehow attaches itself to electrical goods. It has been found that novelty articles, if well selected, will add materially to turn-over, especially at Christmas time. Such lines include art pottery, vases, ornaments, book ends, grass baskets, toys and novelties of various kinds. They are a substantial aid in making attractive windows and lend a gift atmosphere to the store which is very desirable.



Displays suggested by Society for Electrical Development



THE PERCOLATING VACUUM CUP

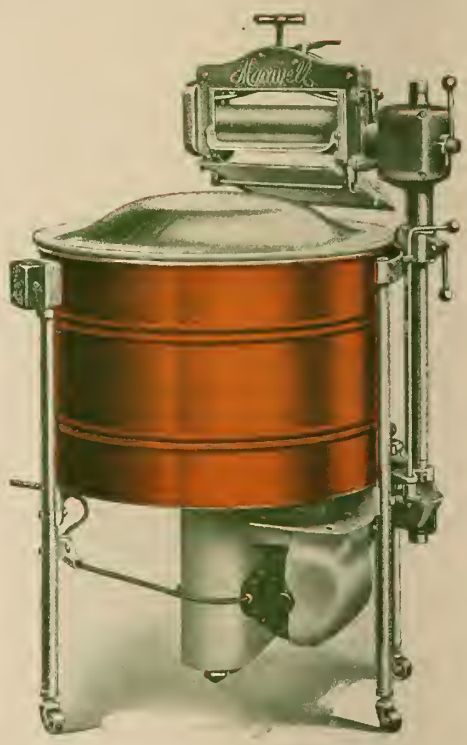
This makes this washer Supreme

Maxwell

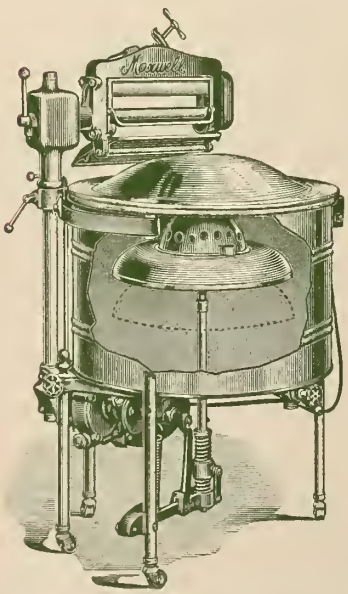
Super-Vac

Electric Washer

Equipped with aluminum metal, quick-releasing swing wringer, with copper tub and embodies the percolating vacuum cup, an exclusive patented feature that makes this washer supreme; with a positive worm drive and safety switch eliminating belts and mechanical slipping devices.



THE SUPER-VAC



SHOWING IMPORTANT FEATURES

The percolating vacuum cup insures uniform action—greater water agitation—a real suction that turns the clothes completely over, and cleans them spotlessly.

The features that make the Super-Vac the most efficient washing machine on the market, also make it the most profitable. Up to the present our sales have exceeded production, but factory production schedules are now adjusted to take care of a most optimistic estimate of requirements. Get all the facts of this washing machine, place your orders immediately for Fall and Christmas trade. It means money in your pocket.

MAXWELLS, LIMITED

ST MARYS, ONTARIO - - CANADA

Makers of Super-vac, Mono-vac, and Minimax electrics

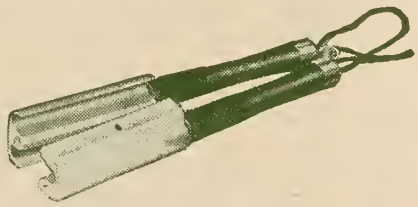
WRITE FOR PRICES AND DESCRIPTVE CIRCULARS

Suitable Electrical Gifts

Staples That Sell Any Time



Washing machine



Marcel waver



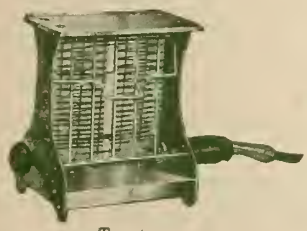
Range



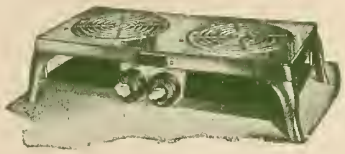
Vacuum cleaner



Air heater



Toaster



Hot-plate



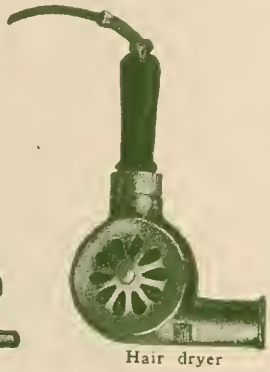
Iron



Grill



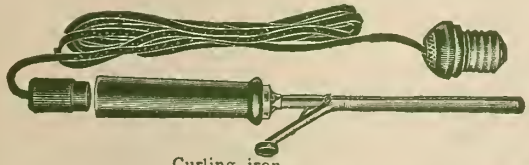
Percolator



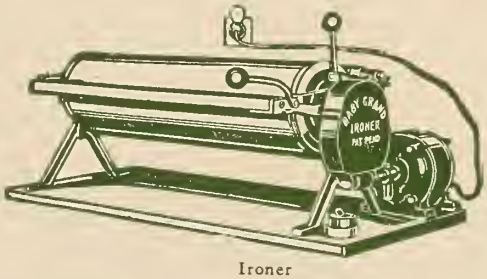
Hair dryer



Chafing dish



Curling iron



Ironer



Heating pad



Table outlet

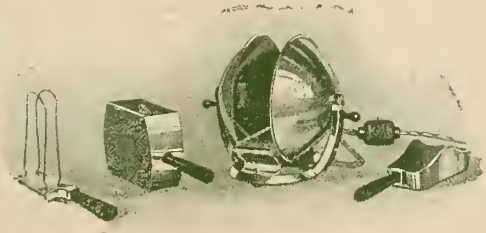
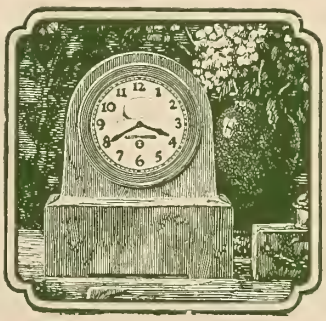


Table stove



Electric clock

The illustrations are chosen as examples, without attempting to include all manufacturers.

Hand yourself a

MERRY CHRISTMAS

Sell the "1900" Washer

CATARACT dealers well know the popularity of this machine as a Christmas gift. For years, they have been accustomed to reaping a golden harvest in the few weeks preceding the festive day. And each year this Christmas business assumes larger proportions.

There is no reason why you, too, should not have your share.

Dealer helps and free advertising service are furnished to aid you in getting every possible dollar's worth of business.

CHRISTMAS IS JUST AROUND THE CORNER. The time to act is now.

Drop us a line for full particulars today.

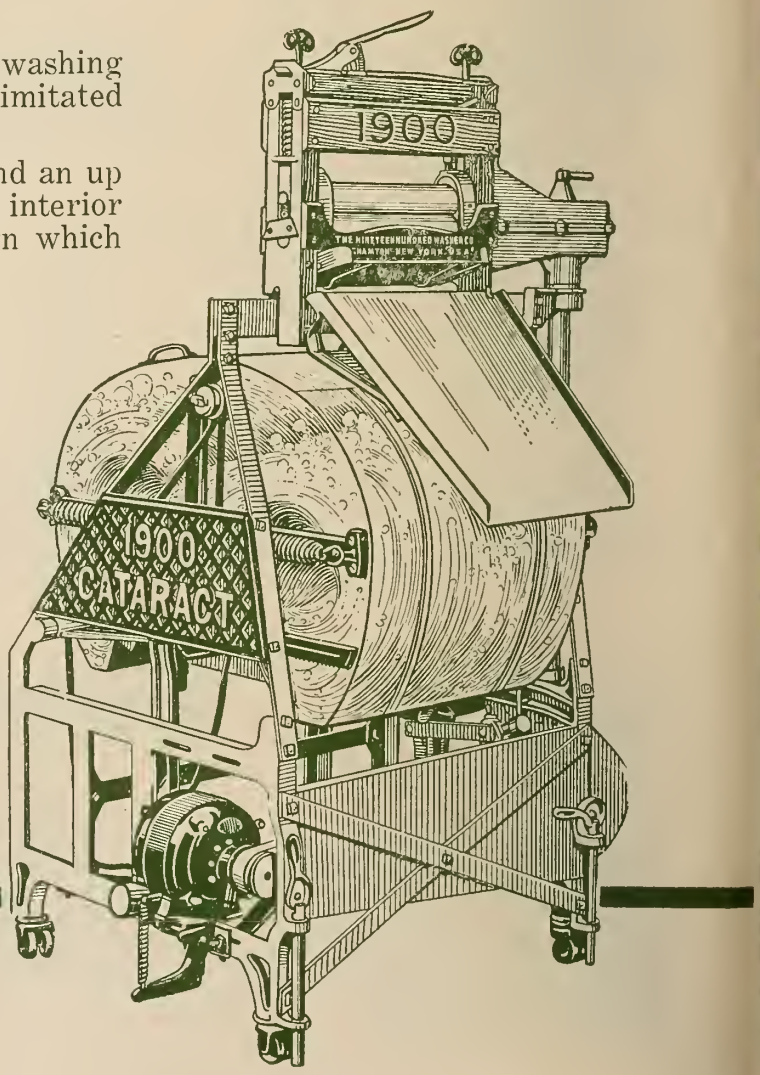
What Cataraction Means

"Cataraction" is a mechanically correct washing principle which has never been successfully imitated for the following reasons:

It has a side to side motion of 6½ inches and an up and down motion of 11 inches. Its curved interior and shape of bottom is an exclusive design which produces the following effect:

The water takes on wonderful life and power, gets over and under and through the clothes. Clothes are turned over repeatedly, 42 times at one end and then 42 times at the other end with the sudsy water.

Result—Clothes washed in half the time.



Beatty Bros.

Head Office

Fergus — Ontario

Largest Washer Manufacturers in the British Empire

Brnches:
Toronto, London. Montreal, St. John, .Winnipeg, Edmonton, Vancouver, London, Eng.

Bright Windows Bring More Business

Holiday Season Calls for New Displays With Christmas Atmosphere

An old definition said that they were the eyes, but a man who knows says that they are more than that. He claims that his show windows constitute the whole face of the store and that he can make them wink, smile, and invite people in. Of all goods sold, he says that 65 per cent. are due to the show window, and the remaining 35 per cent. is divided up by newspapers, circular letters, bill boards, etc.

That is a pretty good incentive to spend a little time and effort on the window display, especially at the Christmas season when people literally walk the streets looking in the windows for suitable gifts.

A really nice small window was made up last year by filling up the whole background with an imitation fireplace.. The bricks were represented by paper printed that way, obtained at a local novelty store.. An electric grate was used with good effect in the fireplace opening, and to add effect, several stockings were hung along a narrow shelf. This was a scheme that gave the dealer plenty of space in the rest of the window to show off the appliances.

Just look at the problem from a detached standpoint. How many times have you walked along the streets for several blocks and not a window attracted your attention? Then suddenly you stopped to inspect a trim that irresistibly attracted. What is the answer? Originality. The man who trimmed the window used ideas out of the ordinary, and those ideas got your attention—just one window out of, perhaps, 25 or 50.

What was the matter with the other windows that you paid no attention to? They lacked that touch of something different that is so essential to business—attention getting methods.

There are many different arrangements which may be used for the Christmas window, and the ones that draw and hold attention are worth spending a little money on. The window does the big job of getting the customer inside. Once that has been accomplished it is up to the dealer.

An effective design includes a small, brightly decorated Christmas tree, placed in one corner of the window. A large part of the remaining floor space is taken up by an electric train, with track properly laid out. In the centre of the enclosure made by the track, a card is placed, bearing the words "For a Good Boy." Various nicely wrapped packages are placed on the other side of the window, as well as unwrapped appliances, in such a way as to balance the design. A grouping of small articles is made around the foot of the tree.

Now is the time to turn over a new leaf if the window has ben neglected in the past. An hour a week will help matters, two hours a week will put your window on the map as a sales getter. Christmas buying is done to a wonderful extent through the window displays that are made, and this opens the opportunity for big results from careful layouts.

The small window is well adapted to use the Santa Claus heads on cordboard, and large green wreath with red ribbon, as the centre of decoration. A standard type of Christmas window which does not involve much time or expense, is to use this large Santa Claus head, or a holly wreath, or big tissue bell, on the back of the window and to run streamers to the various articles. It is important to see that articles in the back of the windows are slightly elevated, and that the streamers do not obstruct the view.





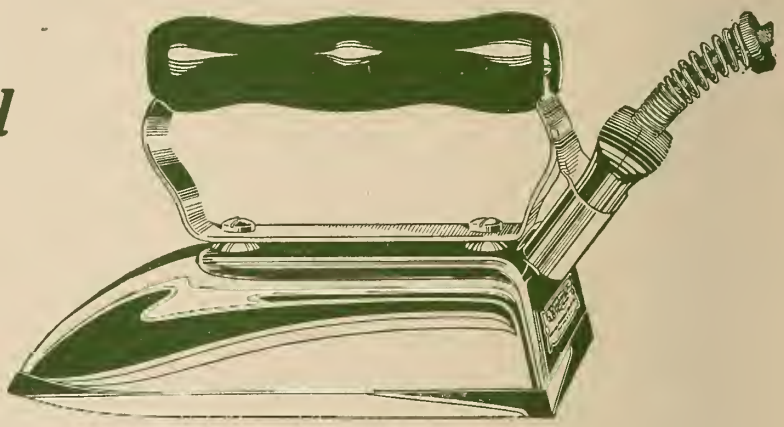
Two displays that proved winners last year. The photos were taken at night.

Sunbeam
The Aristocrat of Irons

Seven Reasons why you should sell it—

1. Heating Unit Will Not Burn Out.
2. Perfect Heat Distribution.
3. Scientifically Correct Design.
4. Cooler Handle.
5. Heavy Nickel Super-fine Finish.
6. Reinforced Plug Guard.
7. New Patented Multi-Plug.

$7.50

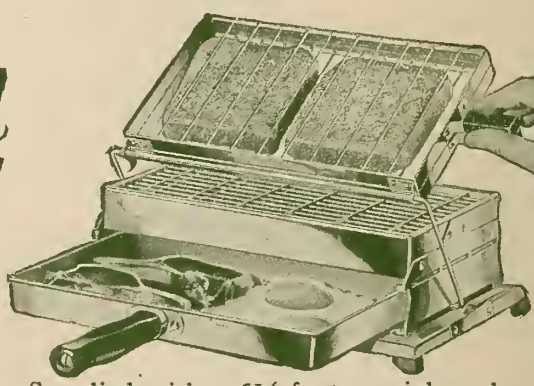


The Sunbeam is selling big because it is the kind of iron people have been wanting. The Sunbeam LOOKS good, and it is GOOD. The seven valuable improvements make an irresistible appeal to women. The Heating Unit will not burn out. Everyone knows what an advantage that is. And a cooler handle and perfect heat distribution that does better ironing. These are some of the reasons why it sells. Then we back our dealers with big expense displays that attract customers. Write for our whole proposition to-day.

Sunbeam ELECTRIC Toaster and Grill

A Complete, Compact, Convenient Table Appliance any woman would be proud to have in her home.

Toasts quickly and well. Cooks right on the table. Sells easily and leaves a good margin of profit.



It
—broils
—fries
—boils
—toasts

Turns the bread over —toasts it flat —the right way

Supplied with a 6½ foot special quality of cord bound with blue silk; and packed in attractive box. Weight, 5 lbs.

$16.50

FLEXIBLE SHAFT COMPANY, LIMITED

349 Carlaw Avenue - - TORONTO

Electric Light to the Fore

Gifts That are Useful



Floor lamp



Hand lantern



Hand lamp



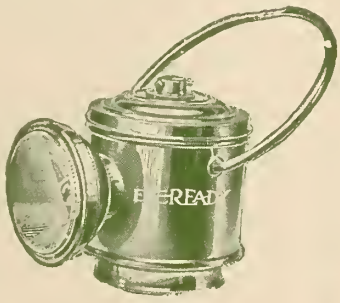
Flashlight



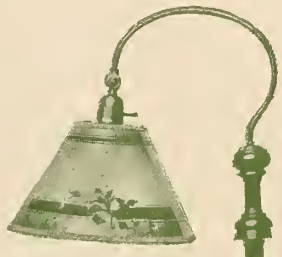
Portable lamp



Portable lamp

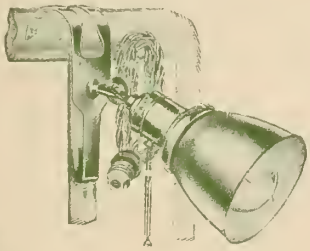


Lantern





Shade



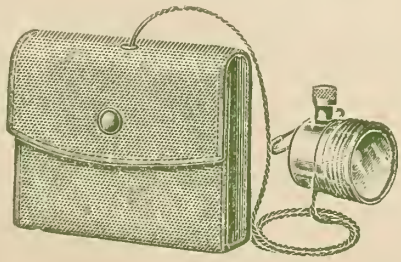
Bed light



Electric lantern



Candle bracket



Cap and lapel light



Floor lamp

The illustrations are chosen as examples, without attempting to include all manufacturers.

The Unit Beautiful

Combined qualities of beauty, efficiency, service, cleanliness and adaptability.

Beautiful Appearance.
Highest Efficiency.
Low Cost for Current.
Clean—No dust catcher.
Adaptable to all uses.



No. 1060

Supplied only in "Cased-Glass" which we have recently perfected and improved.

The purest of soft white light rays in volume, not intensity, giving an efficient distribution of light not equalled in other glasses.

Our Cased-Glass has been adopted by the Toronto Board of Education

NO.	DIAMETER	DEPTH	FITTER	PKD.	SHP. WGT.
1060	12″	7″	6″	1/2 doz.	70 lbs.
1061	14″	8″	6″	1/3 "	70 "
1062	16″	9″	6″	1/6 "	70 "
1063	18″	10″	8″	1/12 "	60 "

Sold to the Electrical Trade Only

FACTORY & HEAD OFFICE
388 CARLAW AVE
TORONTO
DOWN-TOWN SHOWROOMS
164 BAY ST. TORONTO

Jefferson Glass
MADE IN CANADA
COMPANY LIMITED

285 BEAVER HALL HILL
MONTREAL
272 MAIN STREET
WINNIPEG
510 HASTINGS ST. W.
VANCOUVER



IT'S IN THE AIR!

Radio Will Move Fast With Gift Buyers

Everybody is a possible radio customer. There is no limit to the opportunities which aggressive radio merchandising opens up for the dealer. At Christmas time especially, a little push will mean big business.

Let us take a look at the average family which the dealer is trying to reach -two adults, and children ranging from 5 to 20 years old. Every one of them is interested and the only thing necessary to make them buyers is to show them how enjoyable, easy to operate, and value giving a radio set is.

Radio as Gift Merchandise

Considering radio as gift merchandise, it is well to lay stress on the fact that it provides amusement for the whole family. The father who is thinking of giving his boy a radio set, is generally curious as to what it will do for the rest of the family, and he is easily induced to purchase an outfit that includes a loud speaker, on the argument that it will amuse the whole family.

Show Everything

The complete set business is desirable, but remember that the smaller items of radio equipment carry nice margins. Many people, old and young, are still inclined to experiment and add to their sets. The needs of this class must be kept well in mind, and a display of the various radio parts included in every window. A good point has been made by a man who has been successful in radio selling, and that is, it helps business to ticket articles with their names and prices. People are curious about both, and if they can find out before they go in the store, they gain a feeling of confidence that helps sales.

An Easy Way to Examine Your Field

The question as to how far the market has been developed is easily answered by looking at the official list of radio stations in Canada, published by the Department of Marine and Fisheries. It is true that many sets have been purchased since the last edition was issued, but nevertheless there is abundant evidence that the surface has hardly been scratched.

Every householder is a prospect, and there are something like 2,000,000 homes in Canada. Some one in each of those 2,000,000 homes has been thinking about what radio would do for him. For one reason and another they have been holding off—what we must do is to convert their hidden impulses into action—at Christmas time everybody is in the buying humor—they all must buy something, and this year they are going to buy a heap of radio, in the stores which make an honest effort to push it.

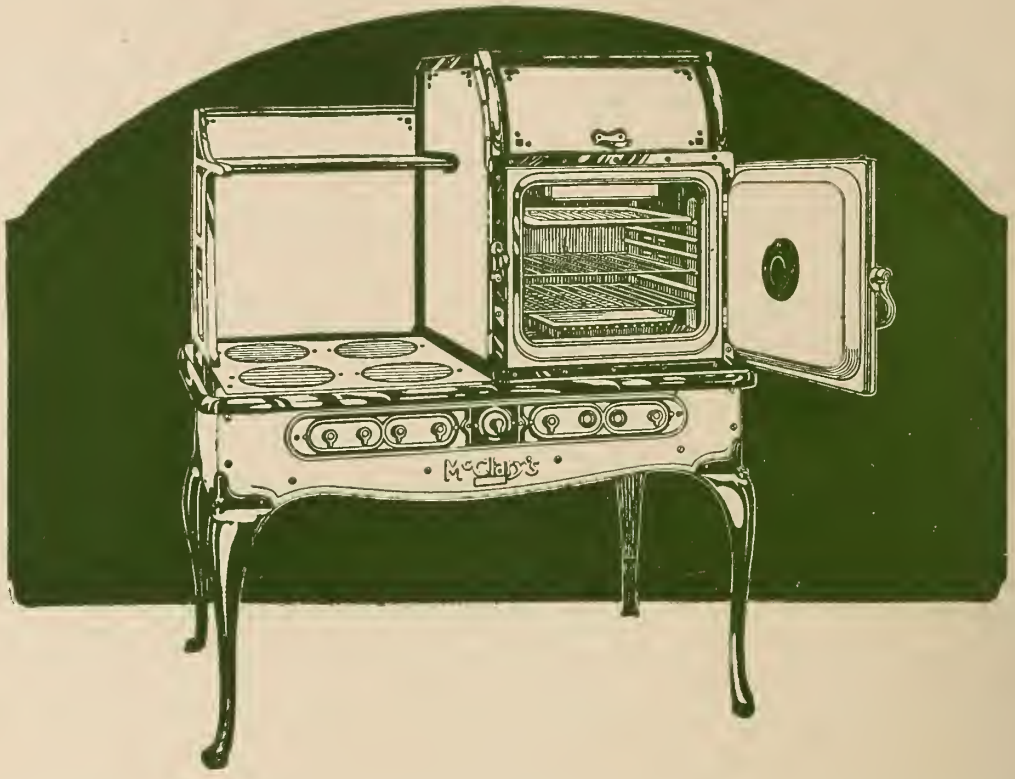
The Fond Parent

Christmas selling in many cases becomes the problem of dealing with a man who is buying a set for his small son, and cares little about the technical side of radio. What he wants is a substantial set, at a reasonable price, simple in operation. Quite likely this customer will say, "Now, I don't know a thing about radio, but my boy wants a set for Christmas and I figure on getting him one. What have you got?"

Naturally that is a very perplexing query. The right procedure is to try to get a line on your customer's buying power. A glance at his dress may tell you, or if in doubt, stall along a little while and perhaps the fact of how much he wants to pay may be revealed. Whatever you do, if you cannot judge what the man has in his mind, don't start in with either extreme. Show the man a moderate cost article and casually mention the price, when he will very likely give you a lead.



Will your place have the Christmas air that the owner of this store achieved?



McClary's Exclusive Features Put McClary's Electric Range Far in the Lead of Other Electric Ranges

The Tor-red element which will cook most of the meals on "Low" besides heating dishwater after the current is turned off.

The round cornered seamless enameled oven which after the oven has been heated to the desired temperature will finish the baking with the current turned "off". McClary's electric oven is highly insulated, electrically welded and finished with a hard tough enamel, as easy to clean as a porcelain dish.

These are the features which make McClary's electric range the most desired range upon the market. Your customers know McClary's superiority through their intensive advertising.

You should thoroughly understand the advantages of McClary's connection and co-operation for electrical dealers.

McClary's London, Toronto, Montreal, Winnipeg, Vancouver, St. John, N. B. Hamilton, Calgary, Saskatoon, Edmonton

McClary's Electric Range

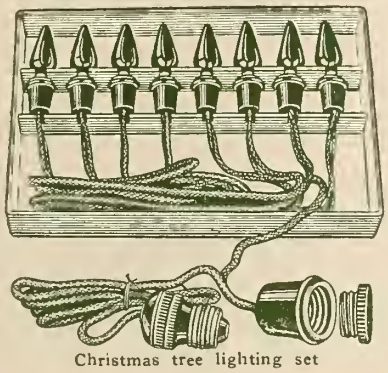
"The only Range with the "TOR-RED" Protected Element'

They Demand Novelties, and Radio

A Good Selection Adds Christmas Atmosphere



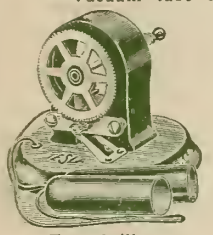
Vacuum tube set



Christmas tree lighting set



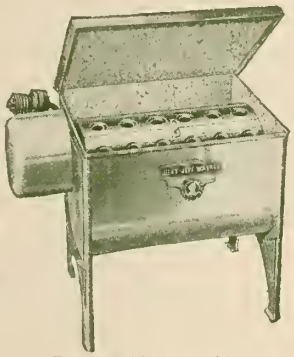
Pottery novelties



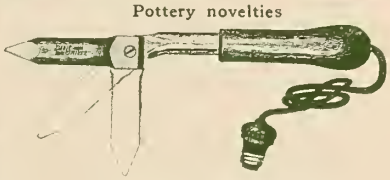
Toy thriller



Toy motor



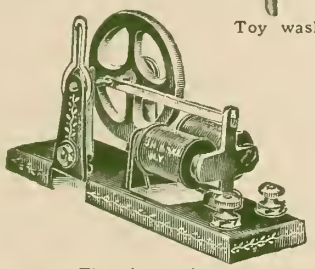
Toy washing machine



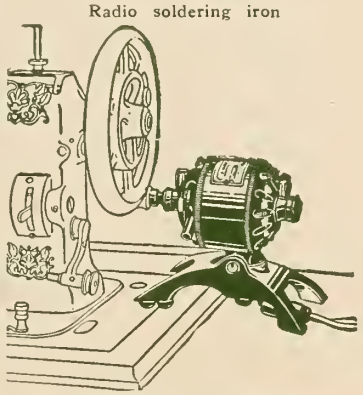
Radio soldering iron



Rheostat



Electric engine



Sewing machine motor



Wireless set



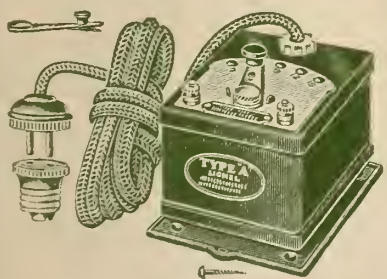
Vibrator set



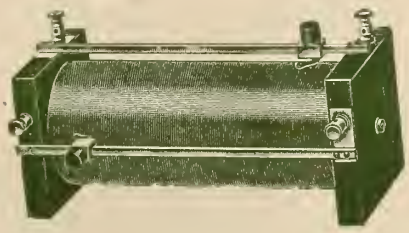
Electric train



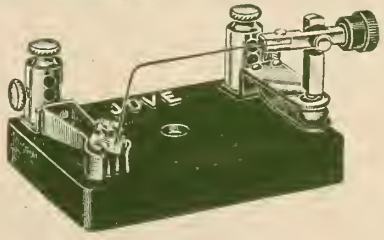
Telegraph key



Toy transformer



Tuning coil



Detector

The illustrations are chosen as examples, without attempting to include all manufacturers.



Play up Gifts that Serve

Push "Majestic" Sales and Win Premiums

Majestic Heater business is just warming up. From now until the end of the year there will be many sales to be made.

Remember, too, every "Majestic" sale swells your total for one or more of the five Free Premiums given as a bonus for live salesmanship.

Electrical Appliances are Christmas Gifts that give daily service. This Christmas will find "Canadian Beauty" goods more in demand than ever among thoughtful givers.

If you want the lion's share of the Christmas electrical gift business, you must carry a complete stock of "Canadian Beauties," and display these handsomely finished, household articles—Irons, Toasters, Grills, Heaters and Percolators—throughout the buying season. We show above a typical window display. To the first twenty-five dealers ordering their Canadian Beauty goods now in our standard package quantities, we will loan them the above, or one of our other window trims.

We are ready now to fill your orders. Get them in early.



Renfrew Electric Products, Ltd.

General Sales Office:
29 Richmond St. W., Toronto

Factories:
Renfrew, Ontario

Canadian Beauty
Electrical Appliances

Christmas Will Bring George Baker Into The Buying Line

His Wife Needs a Washer and the Holiday Spirit Loosens His Pocketbook



A card sent to prospects before call is made

ELECTRIC washing machines, as Christmas gifts, do not fall into the same category with boudoir lamps, curling tongs and other small appliances. These latter are bought as desirable novelties, something that will please the recipient, but without any considerable thought on the matter. On the other hand, nine out of ten people that buy washing machines, enter into the purchase with the same spirit that they buy a home. They have investigated the pros and cons of the question; and are not be be stampeded by any high pressure methods.

They Look Ahead

Hence it will be recognized that nine times out of ten those electric washers which are bought as Christmas presents for the hard working housewives, are thought of for months ahead. That means that any successful effort to sell washing machines as Christmas presents must begin early in the season. The dealer must present to the husbands the idea that electric washing machines make ideal Christmas gifts so far ahead that all the Mr. Buyers will have time to consider it judiciously, and maybe, lay aside the necessary cash.

Mind Processes

An examination into the mind processes of the buyer is of great use in determining selling methods. Let us take for an example a typical home and family, say that of George Baker. Mr. Baker is an accountant in the offices of a manufacturing concern in his city, and he draws a salary of about $200.00 a month. He is paying for his small suburban home, and this fact, added to the constant expense of raising three children, makes him scrutinize every dollar twice before he spends it. Mrs. Baker does all her own housework, including washing, and long habit has bred in her a practice of strict economy. The assumption is, that the dealer is located in Baker's neighborhood, and is in possession of most of the above facts. How is he going to proceed to sell George Baker a washing machine to give his wife as a Christmas present?

The problem is not an easy one. For one thing, George B. is not overburdened with money. Mrs. B. does her own washing now, with a woman coming in only occasionally. Other Christmas demands will swallow up a good deal of George B's cash.

The Big Thing

The big thing to do is to get after George B. early in the season. Tell him what a blessing an electric washer is in the home. Make him visualize the picture of a woman leaning over an old rub-tub, and compare that picture with the one suggested by the magic ease which an electric washer does the work. Show him (it happens that he is an accountant, but any business man will be equally interested) of the dollars and cents saving that a washing machine means. Explain that he can pay an instalment now, and own the machine by Christmas time.

Thus far we have dealt with the case of George Baker, as a particular example of more interest than a general discussion. The general case is the same, however. There are hundreds of thousands of George Bakers all over Canada, and the method of approaching them is the same.

You can scarcely begin too early. Pick out the most desirable names you know. Look at your prospect list. Here is that chap who was interested, but said to come later. Here is the fellow who made some money recently. Here is the man who wanted to exchange a rickety hand power washer. Here is the doctor who recently came to the neighborhood.

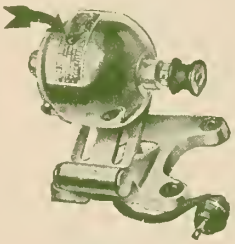
These are your prospects. Call on each one of them, or mail a letter to him at his place of business. Get him into your store in the evening to actually see the washer. Bubble over with enthusiasm about your washing machine, and work up a regular Christmas conspiracy of the fact that he will buy one for his wife as a gift.

STAR-Rite Winners

For the Winter Time

GUARANTEED ELECTRICAL NECESSITIES

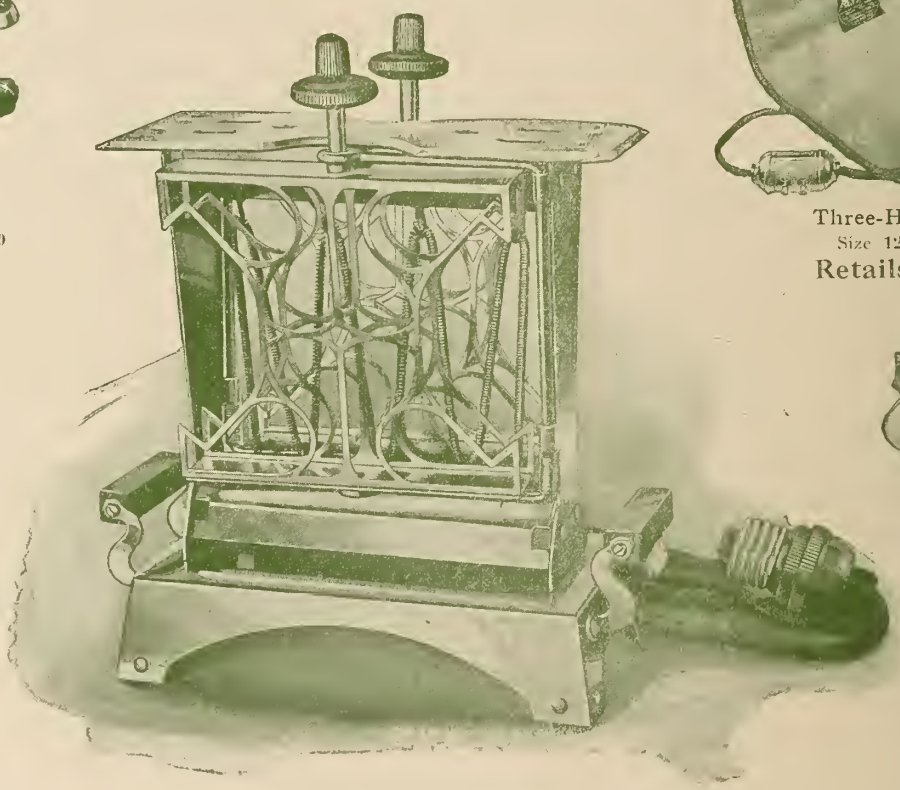
Approved by H. E.P. C.

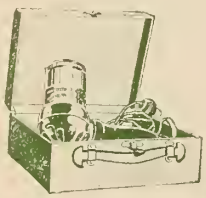


All Nickelled
Sewing Motor
With fool-proof any speed - foot rheostat
Retails - $18.50



Three-Heat Pad
Size 12" x 15"
Retails - $9.00





Hair Dryer
Universal Motor
Aluminum Construction.
Retails - $17.50



Handsome
All Nickelled
Waffle Iron
Complete with Tray
Retails-$12.00

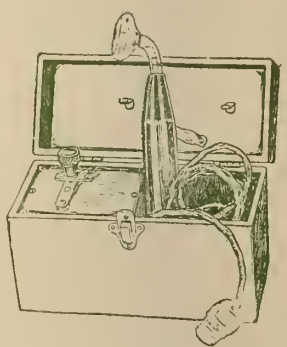
Reversible Toaster
New Model
Retails - $6.75



Motor Vibrator
Complete with Applicators
Retails - $17.50



Model D Heater
12" Copper Reflector
Retails - $6.75



Violet Ray
Cabinet Style
Retails - $17.50

THE CANADIAN FITZGERALD MFG. CO.

95 King Street East, Toronto

Brainy Displays Get Results

Three Christmas Winners

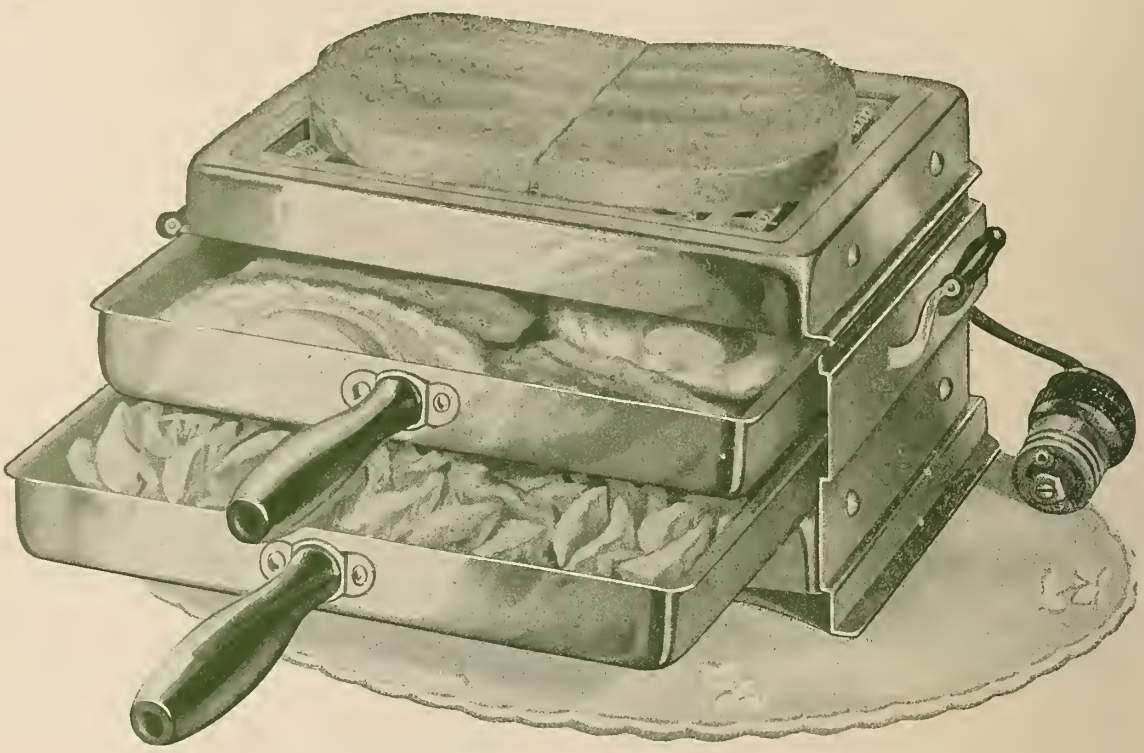


It will be noted that real thought has been given toward securing a holiday appearance in these windows.

Effective decoration depends more on careful planning than upon the cost of the materials used.

—Cut by courtesy of "Contact"

Big Profits on this Quick Seller



Size 8 x 5½ x 4½, exclusive of handles and terminals. Furnished complete with two full sized grill pans. Each 7¾ x 5½ x 1" deep, and cord with separate plug. Operates on any lighting current.

WHITE CROSS Luncheonette No. 55

At last an Electric Grill that BAKES! In addition to frying, roasting, broiling or stewing as well as any gas or coal range.

Every housewife will be interested. For with the exception of the big Sunday dinner she can prepare every meal, breakfast, luncheon, supper, from soup to dessert easily and quickly with less exertion. She can place stove beside her and attend to other work or read—no constant getting up to look at cooking.

Prepares ham and eggs, sausage, stews and soups; broils or fries chops and steaks; makes better coffee and toast, **AND IT BAKES DELICIOUS, CRISPY, BROWN ROLLS AND BISCUITS** at the table!

Cooks above and below heating coils at the same time. Cooks on new principle giving more intense heat than old-style grills. Has 4 heats—cooks fast, medium or slow, as desired.

Many of your customers have been asked $12.00 and $15.00 for grills which cannot compare with this one. But you can sell them this grill which does **ALL KINDS OF COOKING** at an amazing low price.

Your profit will be big.

Beautiful also. Heavily nickel plated; highly polished; ebony handles. Compels attention wherever displayed. Stops everyone at your show window.

Write for Prices

Write us at once for prices. Use the coupon below. We will arrange to send samples to you on approval.

National Stamping & Electric Works
3212-3242 W. Lake Street
CHICAGO :-: ILLINOIS

National Stamping & Electric Works,
3212-3242 W. Lake St., Chicago, Ill.

Mail at once, without obligation, large illustrated circulars of the White-Cross Luncheonette, with special prices.

Name .....

Address .....

City .....

Standard Radio Equipment

(De Forest Patents)

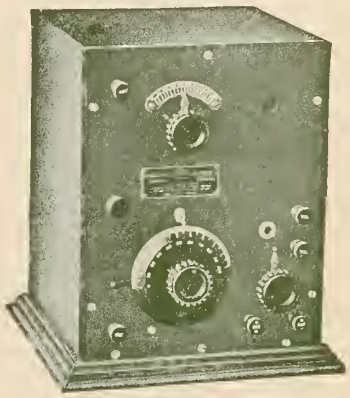
Improved Receiving Sets

Let us tell you about them and how you can cash in on this Season's business.



Universal Receiver

Better Sets at Lower Prices



SC 10. Receiver

Our MADE-IN-CANADA Audio and Radio Frequency Transformers, Head Sets, Plugs, Jacks, Variable Condensers with Vernier Attachment, and other Radio Parts are in great demand because the quality is right and also our prices.

Write to day

Canadian Independent Telephone Co., Limited

Toronto, Canada

Manufacturers of Telephone and Radio Equipment

Radio Corporation of Winnipeg, Limited, Winnipeg, Man.
Radio Corporation of Vancouver, Limited, Vancouver, B.C.
Radio Corporation of Calgary, Limited, Calgary Alta
Radio Corporation of Regina, Limited, Regina, Sask.

Polar Cub
Electric Heater
Retails $7.50

Approved by Ontario Hydro Elec ric Commission



Nearly every feature of our new Heater has been improved and it represents the best value offered on any market.

Specifications

Solid copper reflector 11″ diameter, beautifully burnished, adjustable reflector—wire guard and filament easily detachable. Screw in filament equal to the best. 600 Watts 110 A.C. or D.C. Equipped 7 feet No. 16 Heavy Heater cord and two piece separable plug. Complete window display material with every dozen Heaters.

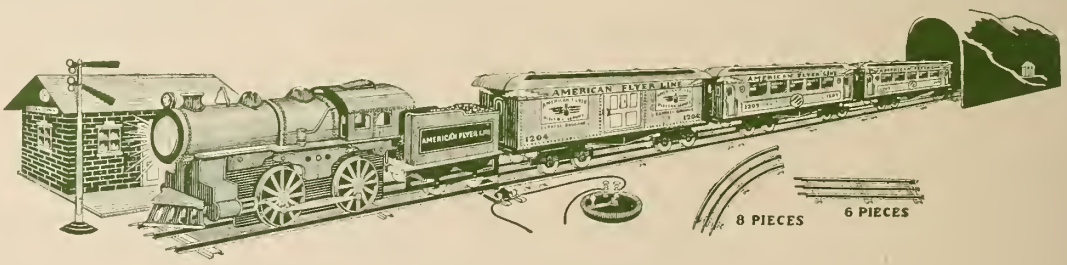
ORDER NOW PLEASE

The A. C. Gilbert Menzies Company, Limited

439 King St. W. **TORONTO**

Polar Cub Fans — Hair Dryers — Vibrators — Sewing Machine Motors — Radio

MINIATURE ELECTRIC RAILROADS



Miniature Electric Railroads are ideal as an attractive window display and popular sellers in the toy department during the Christmas Season. Write for price list of

Electric Trains **Electric Toy Transformers** **Electric Thrillers**
Electric Toy Motors **Wireless Batteries**

NERLICH & COMPANY

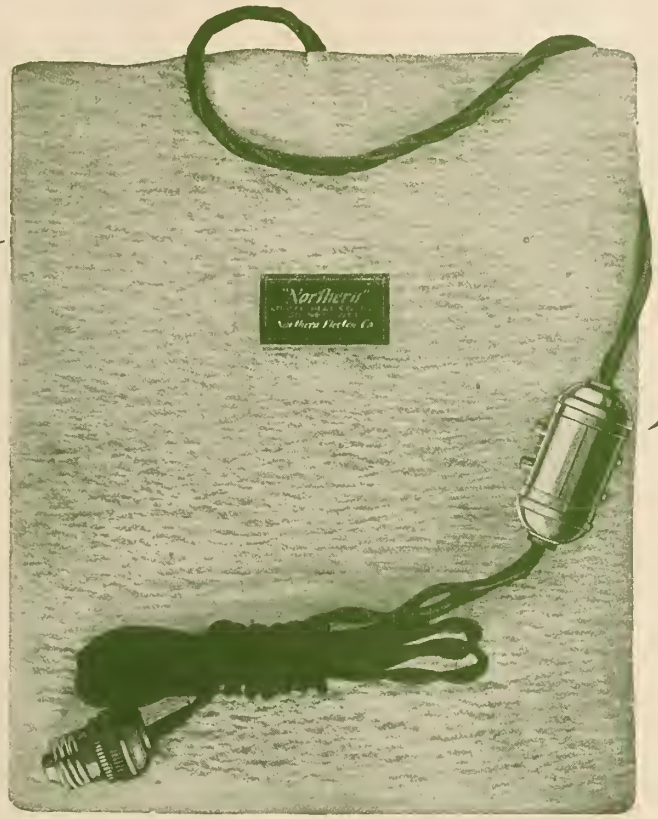
146-148 FRONT ST. WEST **TORONTO**

WINNIPEG
52 Albert Street

MONTREAL
41 Mayor Street

QUEBEC
76 Bridge Street

"Northern" Pads
Always Dependable



Covered with soft eiderdown

Three Heat C-H switch

Two-piece plug— Ten feet of cord

Size 12" x 15"

Demand your Supply to Supply your Demand

Distributed by

Northern Electric Company
LIMITED

MONTREAL TORONTO WINDSOR CALGARY
HALIFAX HAMILTON WINNIPEG EDMONTON
QUEBEC LONDON REGINA VANCOUVER

"Makers of the Nation's Telephones"

MANUFACTURING
Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and-receiving Equipment

DISTRIBUTING
Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

Dealers apply to nearest branch house for prices and discounts



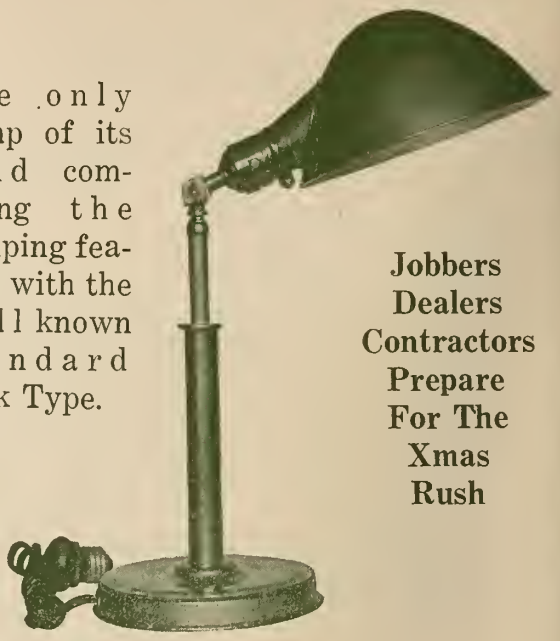
SIMPLEX IRONER

"THE BEST IRONER"

Simple and efficient in operation, economical and long-wearing, the Simplex Ironer combines every feature demanded of a labor-saving device for the home. Our new models have many exclusive advantages.

Canadian Ironing Machine Co. Limited
WOODSTOCK - ONTARIO

The only Lamp of its kind combining the clamping feature with the well known standard Desk Type.



Jobbers Dealers Contractors Prepare For The Xmas Rush

Stock the Clampolier, Larger Sales, Better Profits

Write for prices

Lightolier Mfg. Co., Limited
40 St. George St., Montreal

KLITZEN

REGENERATIVE—

Receiving Sets

Real Radio Simplicity

Only one adjustment

Licensed under Armstrong Patents

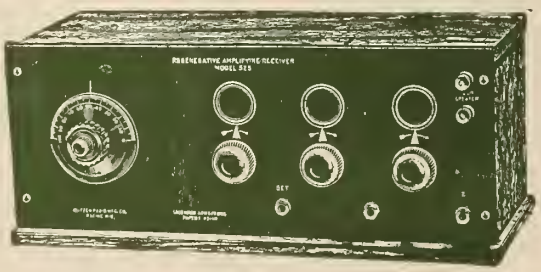
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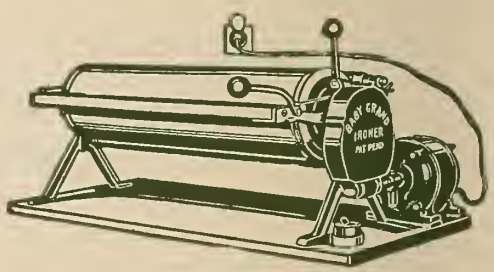
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MODEL No. 525

LIST PRICE $80.00

Small but Sells Big



Electrically heated

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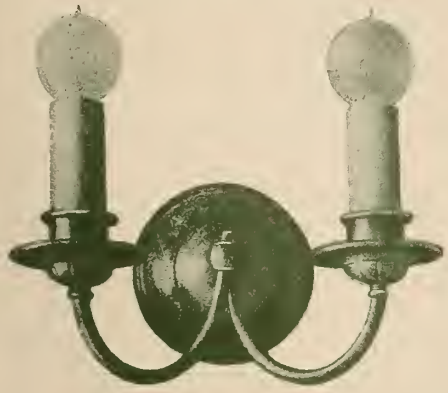
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Tallman Lighting Fixtures

Tallman Fixtures are more and more being recognized as a Quality Line. Fixtures that are well made from heavy weight metal, with lasting finishes. That you don't need to apologize for when offering your customer.

Not cheap, but economical.

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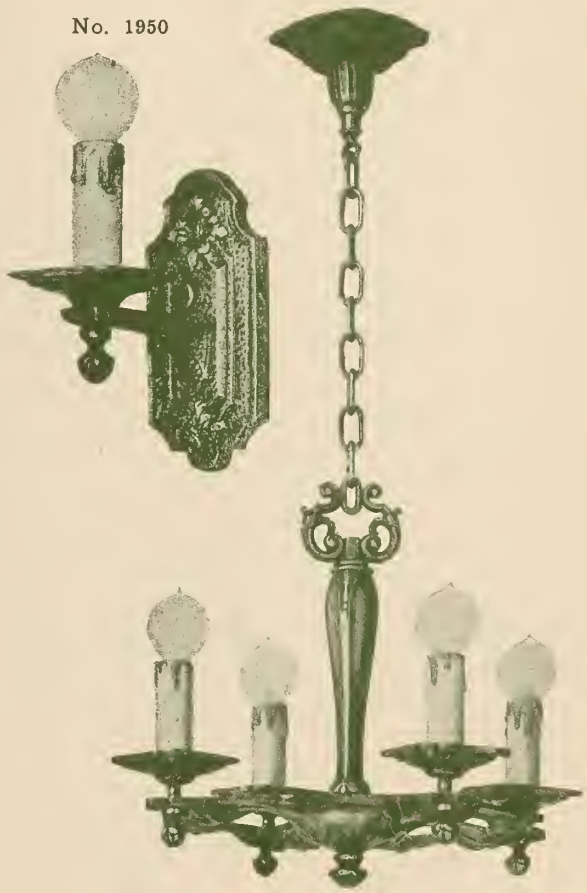
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We are all influenced more or less by light and its reflection and much of the comfort, health and happy conditions in the home are dependent on correct lighting through the proper selection of lighting fixtures.

Make your selections from the **Crown Line**—you get results.

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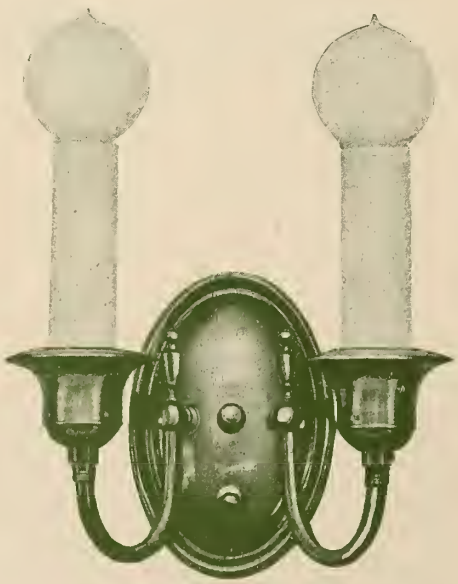
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J. G. G. Kerry Recommends Development of Cheakamus River

J. G. G. Kerry, retained by the city of Vancouver to make a report on possible sites for hydro-electric development by a municipal plant has submitted to the city the result of his investigations. He recommends the development of theCheakamus river which has a possible 1,000,000 horse power on peak, and the Fraser river later. Among other things he recommends that the provincial government make provision in future water power leases prohibiting the export of power to the United States if within reasonable transmitting distance of Vancouver.

In part the report says:

"Exact statements of the output possibilities of the various power sites cannot be made until flow records systematically taken over a period of years are available, but it can now be said no city in Canada is more richly endowed with water power resources than Vancouver, and that a total of over 5,000,000 horse power can be obtained from the rivers nearby to the city.

'The most attractive of these rivers, from the standpoint of the city is, in the writer's judgment, the Cheakamus river, into which it is proposed to divert all the head waters of the Green river.

Peak Output of 1,000,000 Horsepower

"The power sites on the Cheakamus river, after the flow has been strengthened by diversion of waters from the Green river, will justify the installation of machinery to give a peak load output of about 1,000,000 horse power. Long before this supply is exhausted the city should be in a good position to undertake the development of the even greater water powers of the Fraser river.

"As a measure of the sufficiency of the Cheakamus river as a source of supply it may be stated that the peak load demand of Toronto in 1921 (including both the municipal and the private company services) was about 110,000 horse power, while the similar peak load demand of Winnipeg in the latter year was about 90,000 horse power.

"Surveys have not been made in sufficient detail to justify the preparation of final construction estimates, but without doubt a large proportion of the power on the Cheakamus river can be developed and delivered at a less cost per horse power year than either Toronto or Winnipeg are now paying for similar supply.

"A first approximation of the cost of generating and transmitting 35,000 horse power from the Cheakamus river to a terminal station near Vancouver would be about $12.00 per horse power year."

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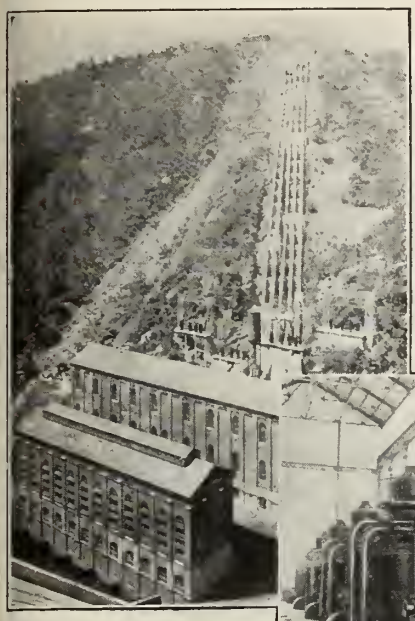
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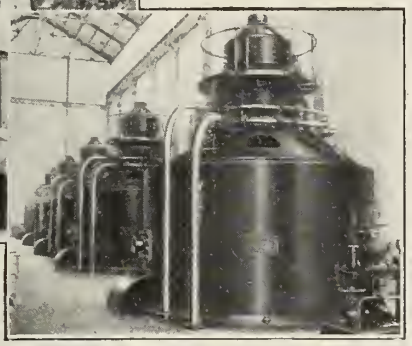
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No.	H.P.	Speed	Make
2	1	1800	Westinghouse
3	2	1800	T.H.E.
1	2	1800	Westinghouse
3	5	1800	Westinghouse
1	5	1800	T.H.E.
1	50	2200	Wagner—No starter

60 cycle, 3 phase, 220 volt, Second Hand Motors

1	1	1800	T.H.E.
1	2	1800	C.G.E.
1	2	600	C.G.E.
1	2	1800	Chapman Walker
1	7½	1200	T.H.E.
1	8	1800	T.H.E.
1	15	1800	Crocker Wheeler with Starter complete.

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1	2	710	Century (new)
1	3	1500	T.H.E. (new)
1	7½	750	T.H.E.
1	10	1400	Imp. Electric with Starter complete.
1	40	710	Westinghouse CCL " " "
6	30	750	Crocker Wheeler " " "
1	15	1450	Westinghouse (new) " " "
1	50	720	Westinghouse H.S. " " "
2	50	750	Crocker Wheeler AQ " " "
3	20	750	Crocker Wheeler " " "

25 cycle, 3 phase, 220 volt, Second hand Motors

1	30	720	Westinghouse without starter
1	35	750	T.H.E. with starter complete
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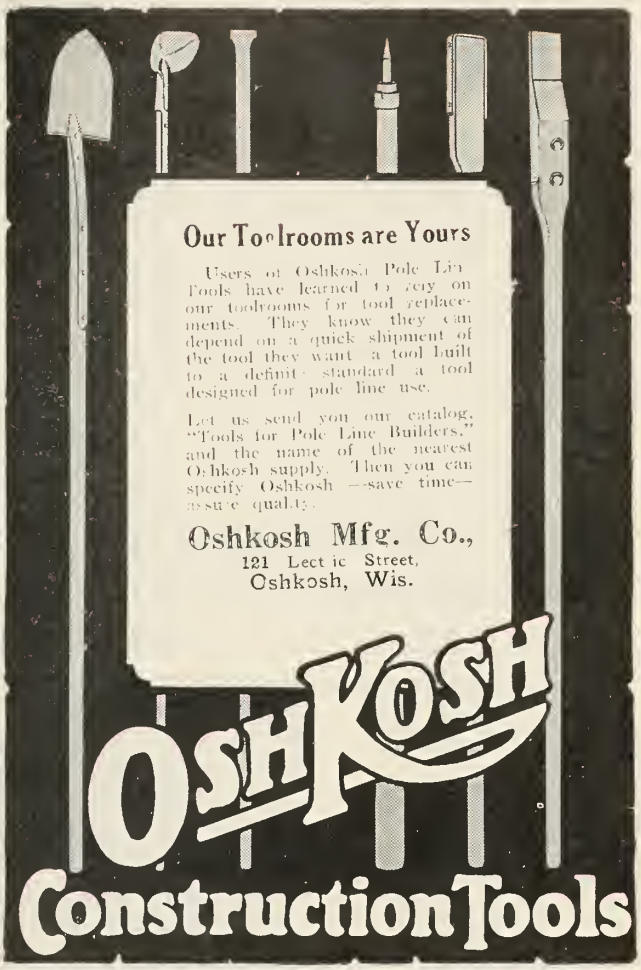
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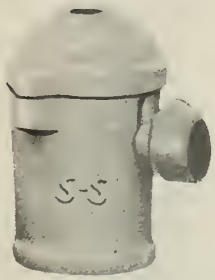
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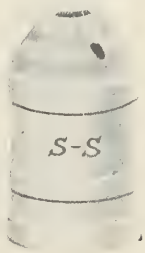
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For attaching purposes, use PAINE EXPANSION SHELLS, in concrete, brick, or stone. PAINE SPRING TYPE TOGGLE BOLTS work instantly in any position in any hollow material. PAINE OUTLET BOX AND FIXTURE HANGERS for lath and plastered or tile ceilings.

Made in Canada. Patented in Canada.

Send for samples and prices.

The Paine Co. of Canada

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Wires and Cables

include bare and insulated, lead covered and armored conductors of all kinds and sizes and for all classes of service.

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LAMP GUARD

THE KEY TO SAFETY

THE strongly made LoXoN Lamp Guards protect lamps from breakage. A lock stops theft and prevents unauthorized removal or changing of lamps.

Keeping lamps where they belong gives control over lamps. A lamp guarded by a LoXon Lamp Guard is always ready for use when wanted. And, too, the average life of each lamp is greatly lengthened because none is taken away or broken for want of the guard.

LoXon Lamp Guards are made in several styles to fit lamps of different sizes and to meet individual requirements. It is economy to use them.

Write for complete descriptive catalog and prices.

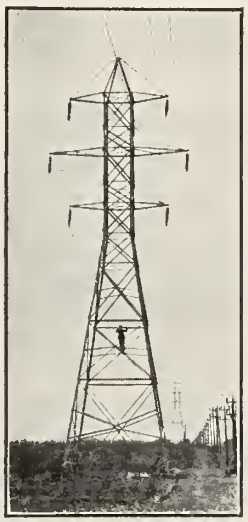
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The modern means of supporting overhead wires.

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We shall be pleased to furnish designs and estimates upon request.

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Structural Steel of all Kinds

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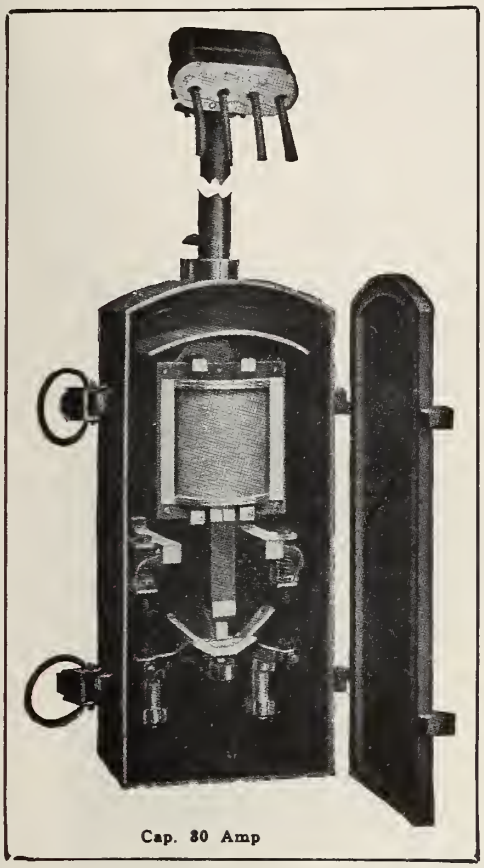
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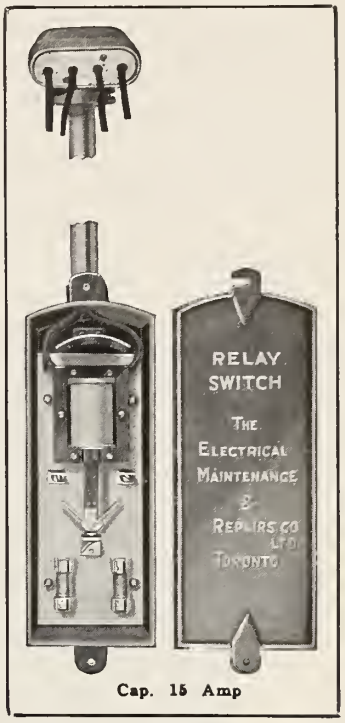
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A new, smaller, simplified Remote Control Switch.

A young friend of our 30 Amp Switch—to do the many small jobs where the big fellow is too expensive.

Cheaper, yet perfectly dependable. Has been tested equal to five years' service.

For Street Lighting Control. Write about this.



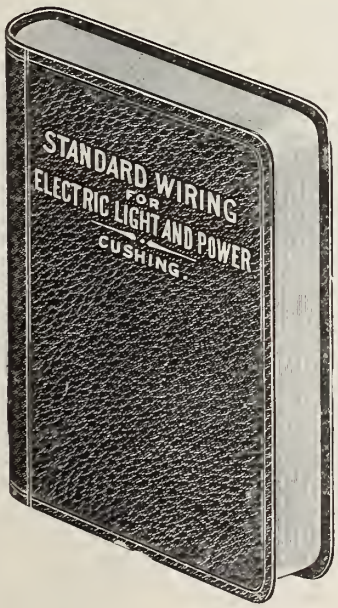
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The Acknowledged Authority on Electric Light and Power Wiring and Construction

The above is the opinion of a prominent official of the Hydro Commission



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This latest edition contains over twice the amount of useful information ever before published. The National Electrical Code explained and illustrated. New illustrated chapters on Outside Wiring and Inside Wiring for all systems for both direct and alternating currents; House and Residence Wiring, Garage Wiring, Theatre and Moving Picture House Wiring, Marine Wiring, Electric Sign Wiring.

How to install, operate and care for Generators, Motors, Storage Batteries, Meters, Electric Ranges and every kind of wiring device for light, heat and power. How to secure the proper illumination for every condition; latest Mazda lamp data; 250 electric terms and their definition and values; the complete Metric system; fifty-two of the latest tables on wires and wiring; all dimensions, weights and capacities of wires and cables for copper, brass and iron; tables, showing at a glance, and without any figuring, the right size of wire for power or lighting jobs for any capacity. New edition just out.

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Electrical News, 347 Adelaide Street West, Toronto, Canada

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Type "AA" 8-Day Clock,
On and Off



Type "A" 1-Day Clock
On or Off only



Self Winding Time Switch
On and Off

Uses to which our Time Switches are put

Complete apartment house hall lightings.

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Write for a copy of our New Catalogue No. 10

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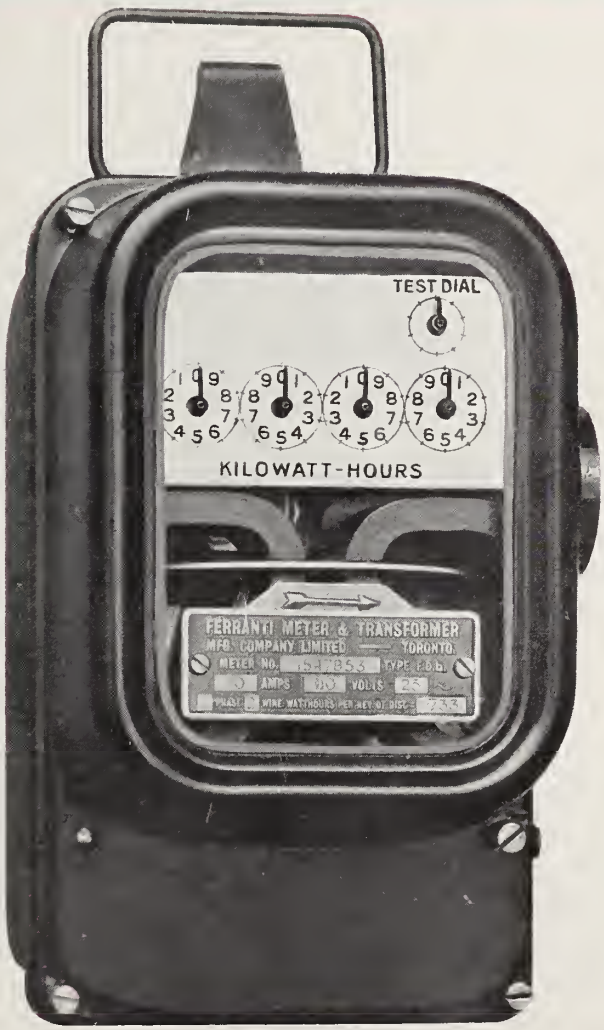
MONTREAL TORONTO

Vol. XXXII No. 21 Toronto, November 1, 1923

Electrical Engineering Contracting News Merchandising Transportation

Type F.D-b

Precision Watthour Meter



The "Correct" Meter To Use

FERRANTI INVITES COMPARISON

ASK THE MEN WHO USE IT

FERRANTI METER AND TRANSFORMER
MANUFACTURING COMPANY LIMITED
Head Office and Factory TORONTO, CANADA

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THOUSANDS ARE BUILDING THEIR RADIO SETS

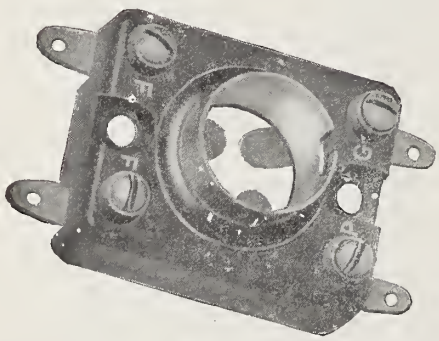


R 215A Peanut Tube

The Peanut Tube is therefore a necessity.

For bringing in distant stations it has no equal.

Operates on a single dry cell battery.



R40 SOCKET

DEMAND YOUR SUPPLY AND SUPPLY YOUR DEMAND

Manufactured in Canada by

Northern Electric Company
LIMITED

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BENJAMIN ELECTRIC MFG. CO.
OF CANADA, LIMITED

TORONTO

MONTREAL *WINNIPEG*


Elliptical Angle Reflector Socket

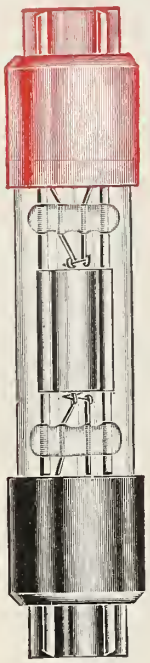

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Dome R.L.M. Reflector Socket


Flat Cone Reflector Socket


Deep Bowl Reflector Socket

The Tube's the Thing!



Full Size

FOR GOOD RADIO RECEPTION
ONLY GOOD TUBES CAN BE USED

Myers Tubes

ARE DESIGNED PURELY FROM THE STANDPOINT OF THEIR REQUIREMENTS AS RADIO EQUIPMENT

This design brings the leads from the grid and the plate of the tube out of opposite ends: in this way the capacity of the tube is reduced and the efficiency greatly increased. In plain words this means that by bringing the leads out of the different ends instead of all in a **bunch at one end** the large electrical capacity effect so harmful to the proper operation of a Radio Vacuum Tube is eliminated. **All elements of the Myers Tube do their work properly and do not interfere with each other.**

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AMPLIFIER
OSCILLATOR

Tried and Found to be the Best in Every Country in the World

MYERS DRY BATTERY TUBE
2½ VOLT–¼ AMPERE
FOR OPERATION ON
2 DRY CELLS

Either Type
FIVE DOLLARS
COMPLETE WITH MOUNTING CLIPS READY TO BE MOUNTED ON YOUR SET. NO ADDITIONAL SOCKETS OR EQUIPMENT NECESSARY

MYERS UNIVERSAL TUBE
FOR OPERATION ON EITHER
3 DRY CELLS OR
STORAGE BATTERY

MADE IN CANADA

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Telephone for
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Still Open

Under Canadian Patents No. 229,182, Patent No. 229,183, Patent No. 229,184, and many other patents issuing and pending.

EXCLUSIVELY BY

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Radio Vacuum Tubes

Your trade will demand Myers tubes—be prepared—put in your stock now.

240 Craig Street West *Telephone Main 7822* **MONTREAL, QUEBEC**

A MARK OF QUALITY

Diamond·F

A SIGN OF SERVICE

Ready Radio Sellers



The Friend Makers

also the profit makers.

Celoron Panels have met with instant approval from both amateur and experienced radio fans, because of their excellent and superior insulation qualities, uniformity and moisture repelling properties.

Condensite Celoron—from which these panels are made—is used and approved by leading manufacturers of radio supplies.

These, among many other reasons, are why the dealer who is prepared to supply Celoron panels to an ever growing trade is going to make friends, and have friend's friend come into their stores.

Celoron Panels are easy to handle, and take up very little store space. Best of all, they allow a large margin of profit on each sale.

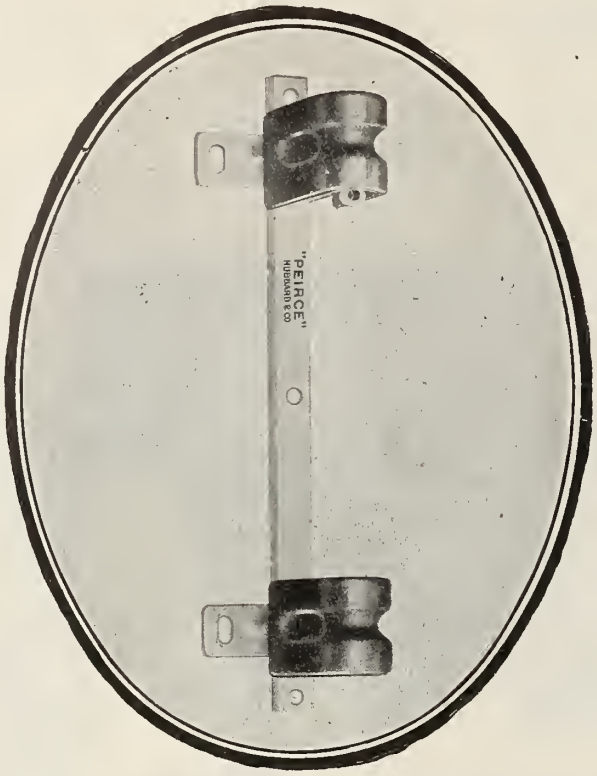
No extra cost for cutting or wrapping, as each panel is wrapped in a glassine envelope with printed instructions for working and finishing. They are made up in the following sizes: 6 x 7, 7 x 9, 7 x 12, 7 x 14, 7 x 18, 7 x 21, 7 x 24, 7 x 26, 9 x 14, 12 x 14, 12 x 18. Thicknesses: 1/8″, 3/16″, or 1/4″. Immediate delivery can be made on all special sizes and machine work such as drilling, counter boring, etc.

When you sell a fan a Celoron panel, you open up the way for other sales, because of the confidence inspired by selling him something "real good."

Send in today for price list and information of free display material for your counter and window.

Diamond State Fibre Company of Canada Ltd.

Wrigley Bldg., Carlaw Ave., Toronto



The Peirce Wireholder 299

There is a large degree of flexibility to these brackets. This 299 bracket has a nine-inch spacing—but by simply bolting a Peirce 191-A to the centre it is converted into a three-point bracket with 4½″ spacing.

The Modern House Bracket

The flexibility and the neatness of the Peirce house brackets are two of their good features.

They are sufficiently strong for a large part of your secondary work; and may be used in any position.

There are seven different styles of these house brackets—making a full range for all house wiring.

190—single point
a jab—a few turns—and it's in—

191A—single point
extra point for use on 296 and 299.

299—two-point convertible

296—two-point convertible—6 inch spacing

396—three-point.

394—three-point—four and one-half inch spacing.

Ask your jobber.

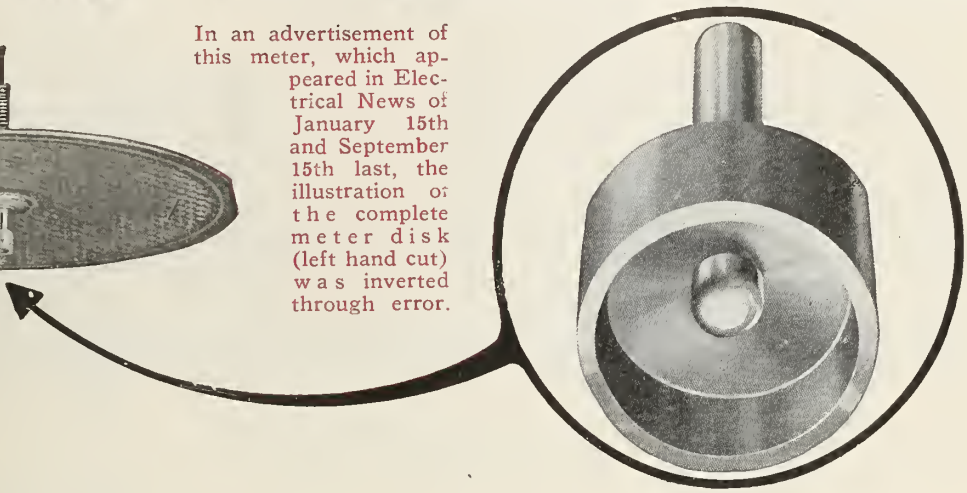
N. Slater Co., Limited

Hamilton, Ontario

Sustained Meter Accuracy Depends on Pivots and Jewels



In an advertisement of this meter, which appeared in Electrical News of January 15th and September 15th last, the illustration of the complete meter disk (left hand cut) was inverted through error.



The Sangamo Energy Meter is available with the Lincoln Demand Meter sold as the **Lincoln-Sangamo meter**

THE excellent quality of pivots and jewels is one of the factors responsible for the sustained accuracy of Sangamo Type "H" alternating current watthour meter.

Performance in service is the real test of a meter bearing. "The proof of a pudding is in the eating thereof," and an abundance of evidence covering years of service has demonstrated the excellent wearing qualities of Sangamo pivots and jewels. Numerous service tests have shown that after many million revolutions of the meter disc neither the jewel nor pivot show the slightest wear.

THE PIVOT DUST GUARD shown in the illustration provides a practically dust-proof protection for the jewel bearing. Since it is mounted on the pivot and projects downward, completely enclosing the jewel and pivot, dust and particles are shed away from the jewel, not into it.

The pivot guard at the same time serves as a protection for the polished surface of the pivot and prevents it from being touched in handling when removed from the meter for inspection.

There are many other reasons why the Sangamo meter has so many friends. Let us tell the whole story. Send today for Bulletin No. 55-C describing Type H alternating current watthour meters.

SANGAMO

Sangamo Electric Company of Canada, Limited

Factory: TORONTO Head Sales Office: MONTREAL

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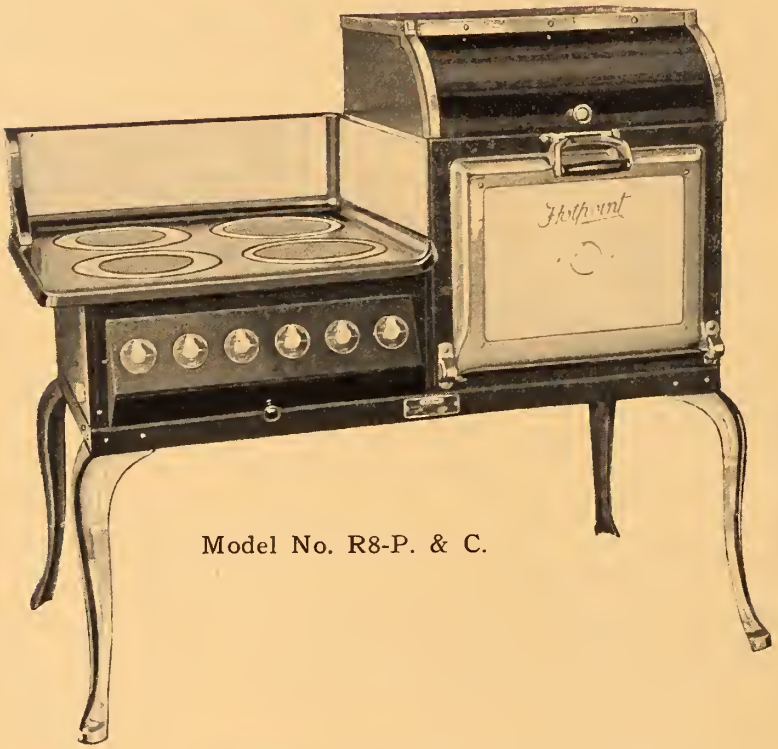
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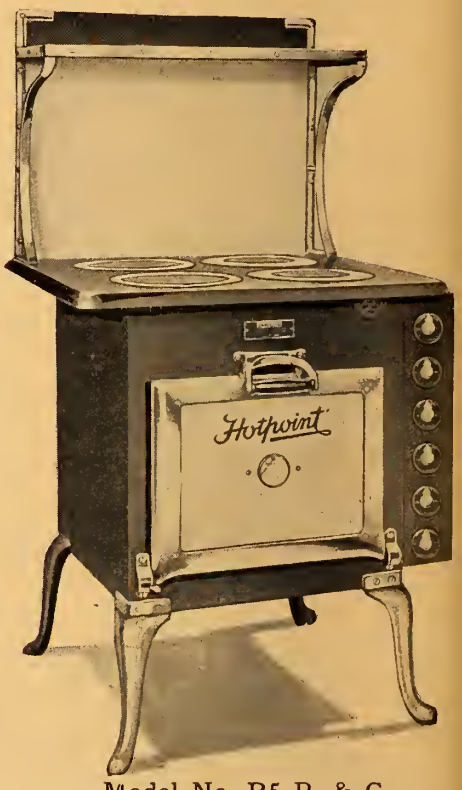


Model No. R8-P. & C.

Ranges

THIS low oven model is ideal for use in homes and apartments where floor space is at a premium but where ample cooking capacity is essential.

The oven construction is identical with the R8 Cabinet type. Patented sheathed wire oven elements upper and lower 1200 Watt. The oven construction is standard on P. & C. Types.



Model No. R5 P. & C.



THE new R8 model retains its unique feature of having 40% less surface to clean than the standard cabinet type of range.

The oven is of the flush type with smooth rounded corners and has a vitreous enamelled surface which will not rust. The oven parts including the elements may be removed for cleaning, leaving only the four enamelled walls of the oven which are as easy to clean as the top of a piano. The surface elements consist of one 8½" 1600 Watt and three 6½" 1000 Watt patented cast-in sheathed wire elements.

"Hotpoint Sheathed Wire elements are the fastest protected elements made"

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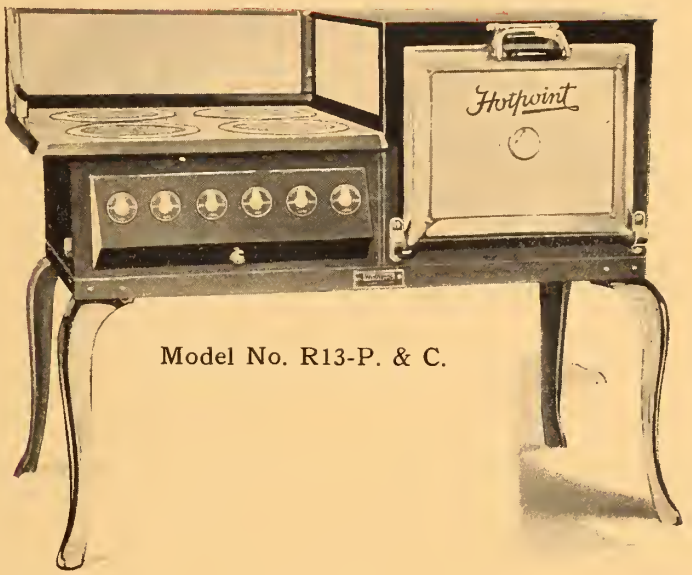
Complete with—

Sheathed Wire Elements

(Patented)

MODEL R13 has been designed especially for use in kitchens where it is necessary to place the range in front of a window. This range is so constructed that it will not obstruct the light and yet provide ample cooking surface and a full sized oven.

The oven is the same size as the Model R8 as is also the cooking surface. A feature of the new Hotpoint oven lies in the fact that the oven elements are removable and interchangeable one with the other.



Model No. R13-P. & C.



Model No. R11-R11-P

MODEL R11 is a low priced type, built especially for kitchenette use. The oven lining is vitreous enamelled and will not rust. The cooking surface is 21 by 30 inches and the oven 13 by 18 by 13". A high shelf can be supplied if desired. The R11 is equipped with open coil surface and oven elements. The surface elements consist of one 8½"—1700 Watt and two 6½"—900 Watt. R11P is equipped with patented cast-in sheathed wire elements one 8½"—1600 Watt and two 6½"—1000 Watt.



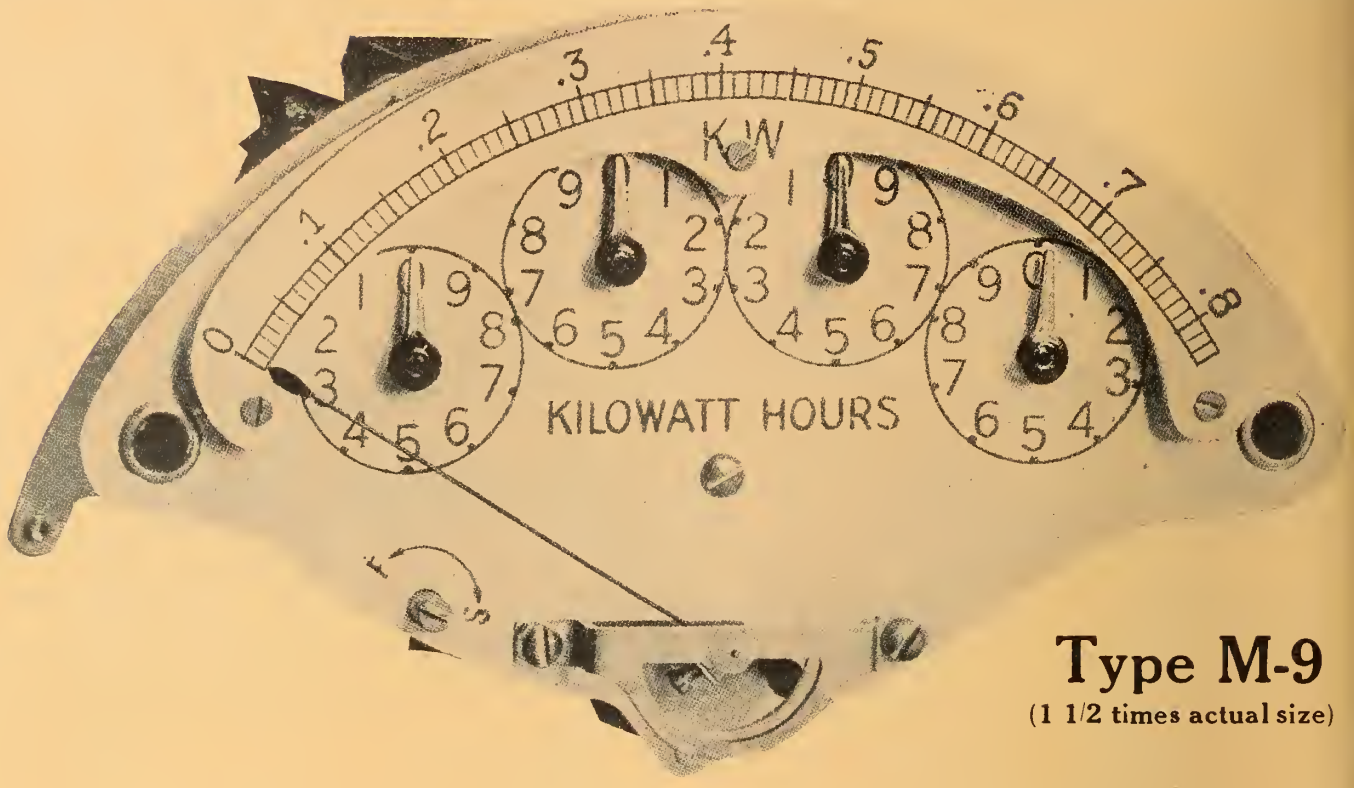
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A New Demand Meter Register



Type M-9
(1 1/2 times actual size)

THE Canadian General Electric Company Limited, announces the new M-9 Demand Meter Register superseding the M-7 and incorporating several marked improvements.

The M-9 is a demand meter embodied in the register of the 1-14 single-phase or D-6 polyphase Watthour Meters. It is furnished as a combined device with the watthour meter, or separately for installation in meters now in service.

The new register is very simple in its mechanical design and possesses the following prominent features:

- Instantaneous and positive reset.
- Long scale.
- Improved timing motor with greater torque and power.
- Light-weight rotor in motor.
- Micrometer adjustment of timing motor speed.
- Micrometer zero adjustment for demand pointer.
- Provision for quickly returning watthour pointers to zero.

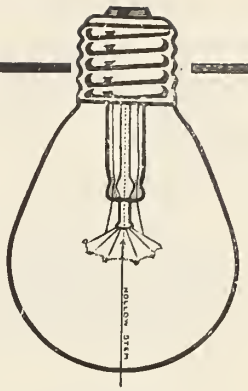
As a leader and pioneer in the art of meter and instrument building the Canadian General Electric Company offers one of its latest developments in this line. The C.G.E. Office in your locality will furnish additional information on request.

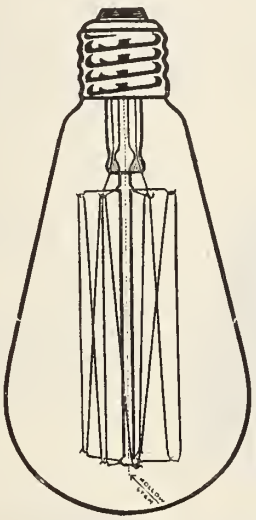
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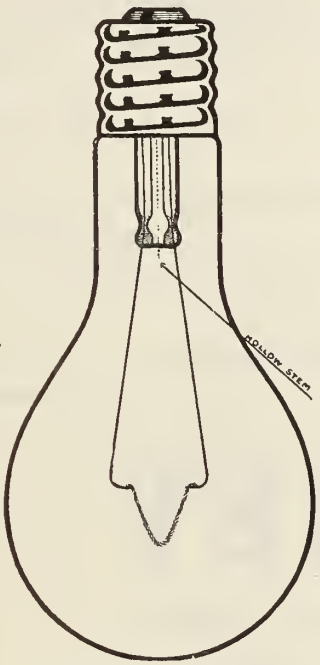


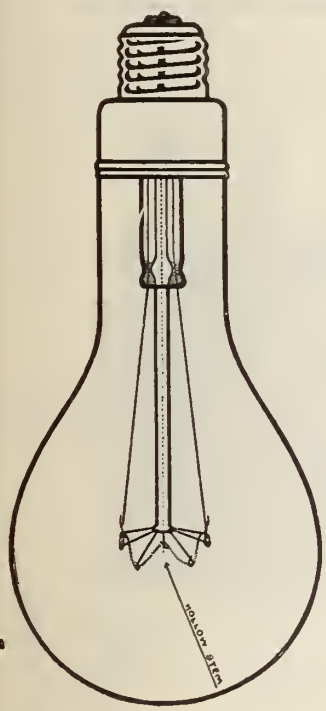


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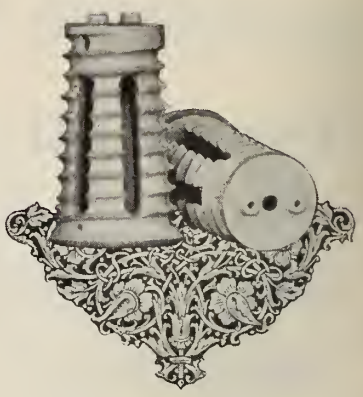
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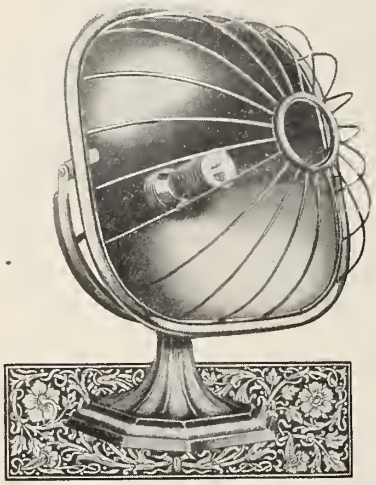
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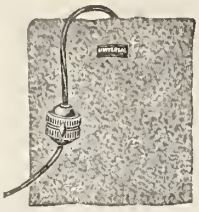
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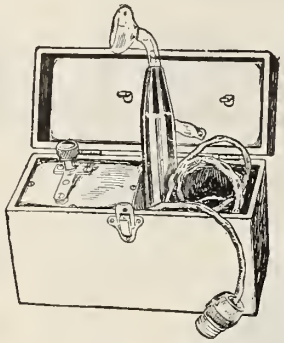
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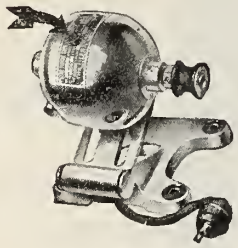
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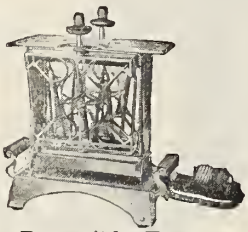
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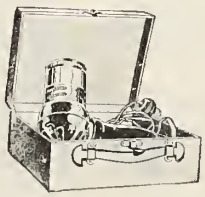
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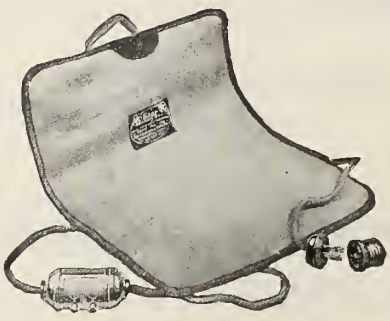
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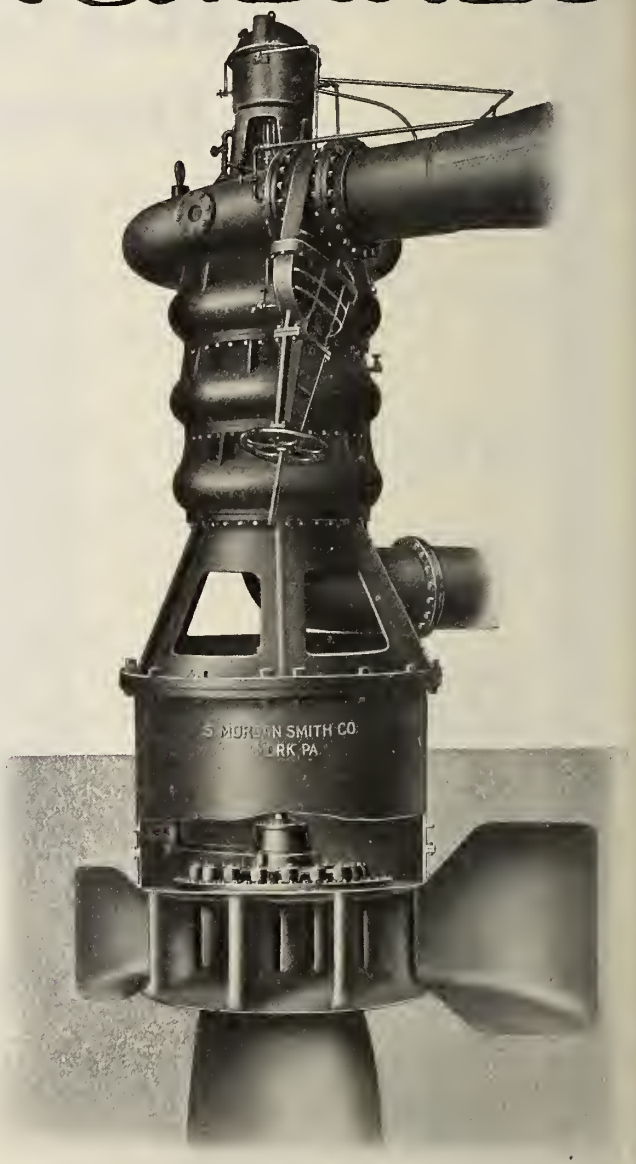


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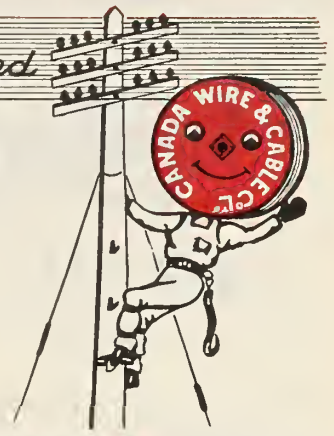
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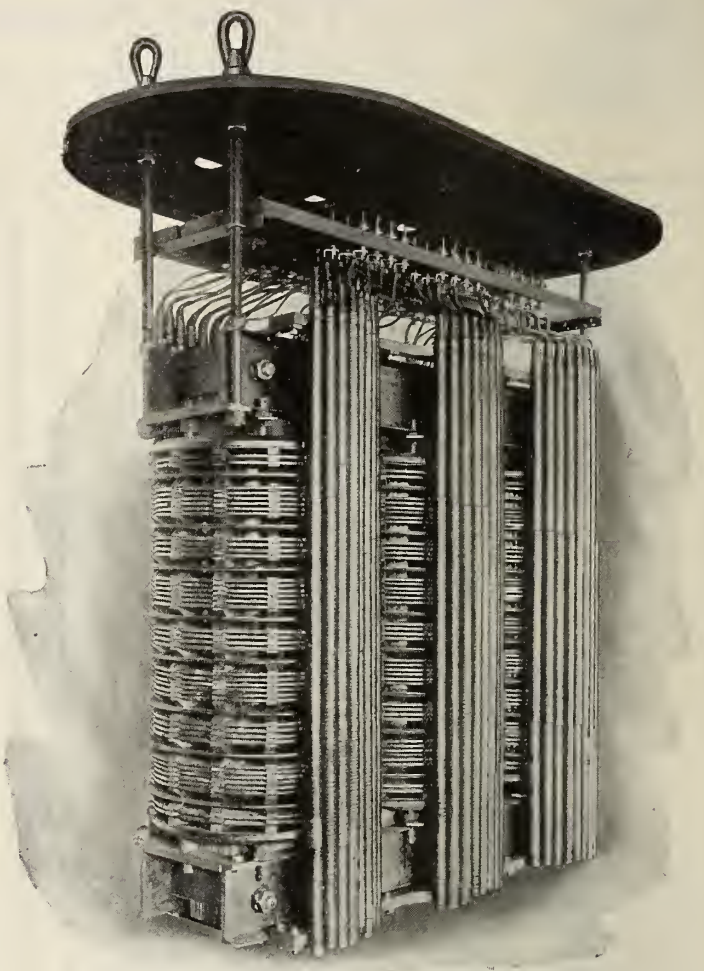
Not easily recognized at first sight—its lack is only too potently felt in use.

Ever since 1888 this Company has made "Superiority" its watchward.

If our designs do not show it, they die before they ever leave our drafting room.

A Canadian Crocker-Wheeler product must lead or we won't sell it.

In this Transformer note the large surface of the windings in contact with the oil, which ensures ample insulation and efficient cooling. Note the staunch method of bracing the coils to prevent distortion under severe overload or short circuit conditions.



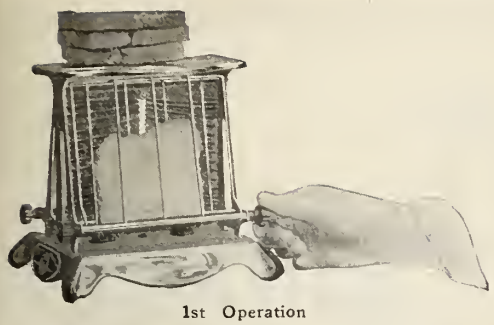
Core and coils of 1500 K. V. A. 45700/26400/13200 Volts to 4000/2300/575 Volts, 3 phase, 25 cycles, oil insulated, water cooled Canadian Crocker-Wheeler Transformer

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CROCKER-WHEELER CO.
LIMITED
Manufacturers and Electrical Engineers

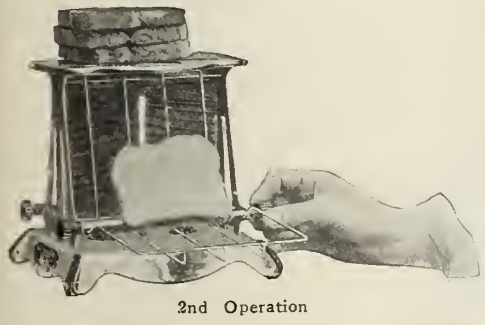
Head Office & Works: St. Catharines, Ont. Dist. Offices: Toronto, Montreal, Sydney, N.S., Ottawa

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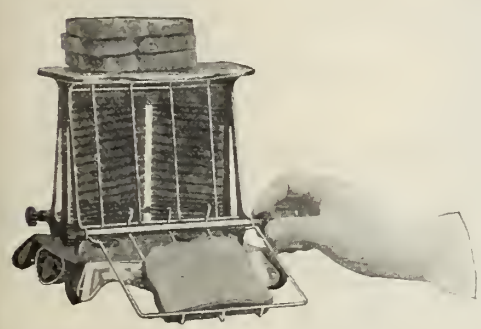
Montreal, Halifax, Quebec, Toronto, Hamilton, London, Windsor, Winnipeg, Regina, Calgary, Edmonton, Vancouver.



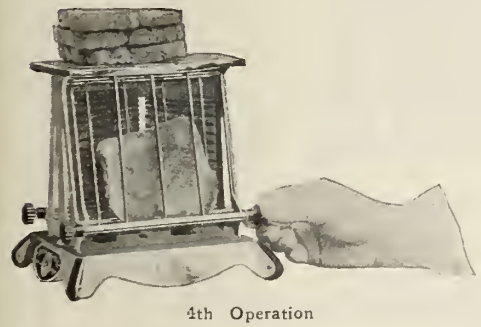
1st Operation



2nd Operation



3rd Operation



4th Operation

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Makes toast right on the table. Turning the insulated knobs turns the toast.—No danger of burning the fingers.

The "Turnover" feature consists of swinging racks on each side, which are hinged at the bottom. It is unnecessary to touch the bread from the time it is put on the racks until it is taken off, toasted.

The racks are raised and lowered by means of ebonized knobs. This simple operation turns the toast.

The flat surface on top of the toaster may be used to keep the toast hot, or it may be used to heat plates, keep the coffee warm, etc.

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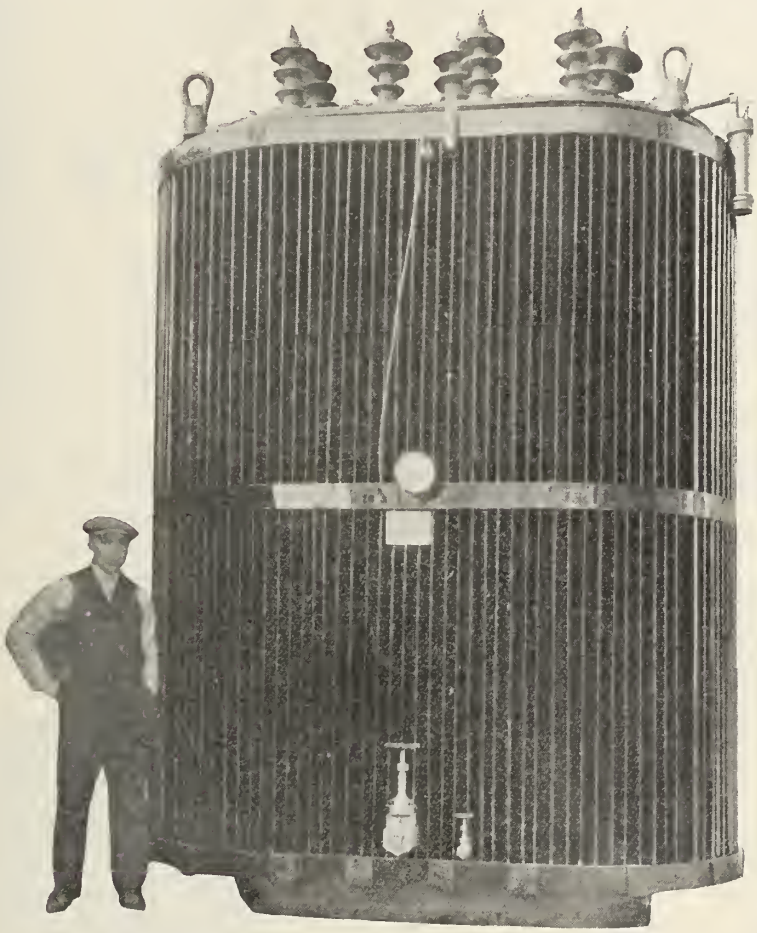
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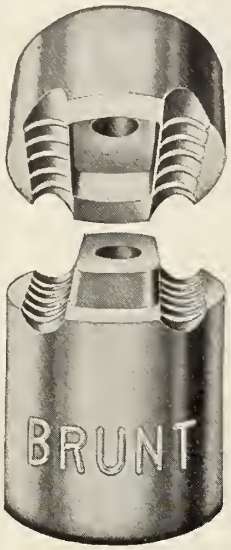
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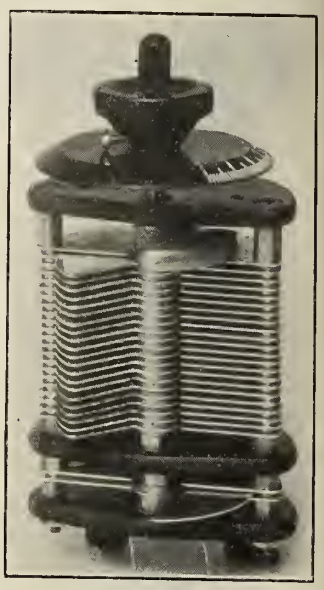
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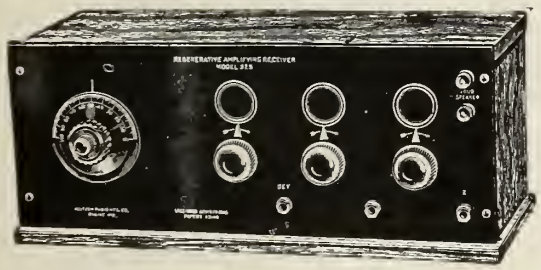
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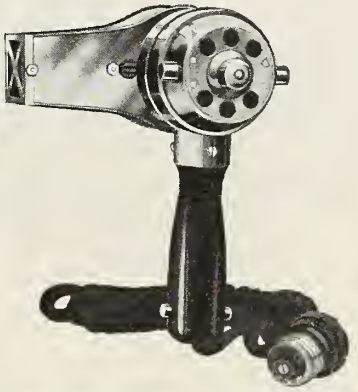
Polar Cub

Electric Hair Dryer

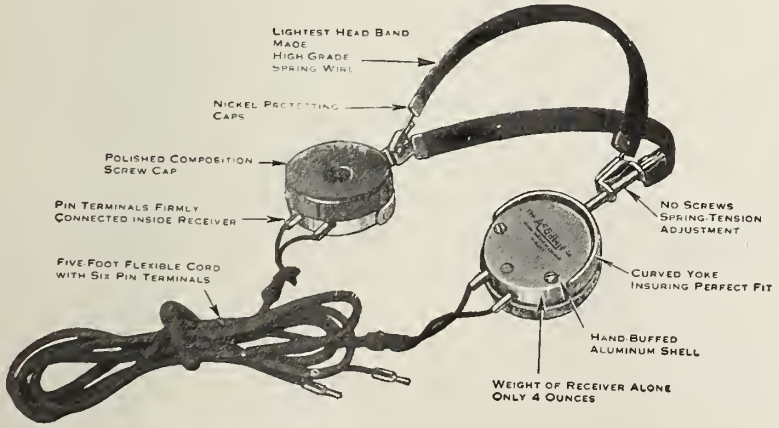
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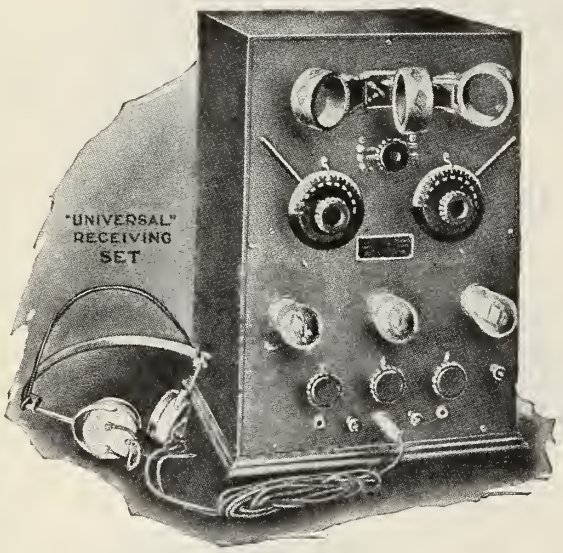
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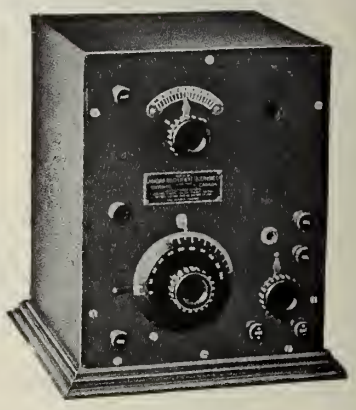
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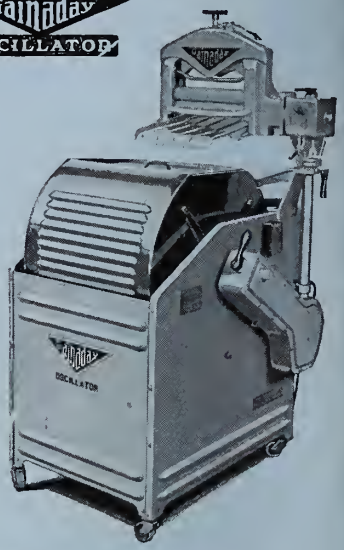
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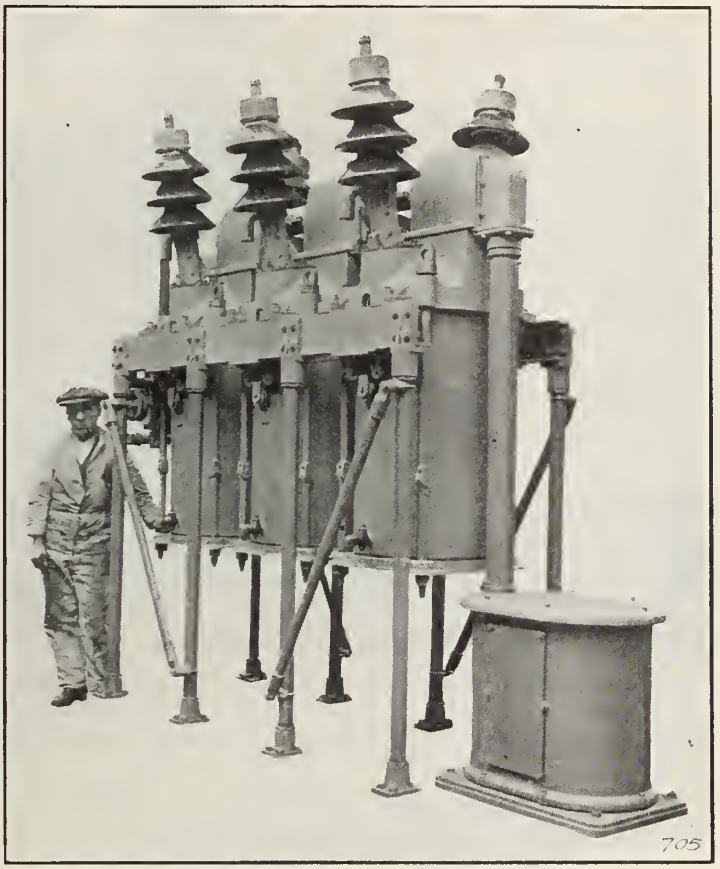
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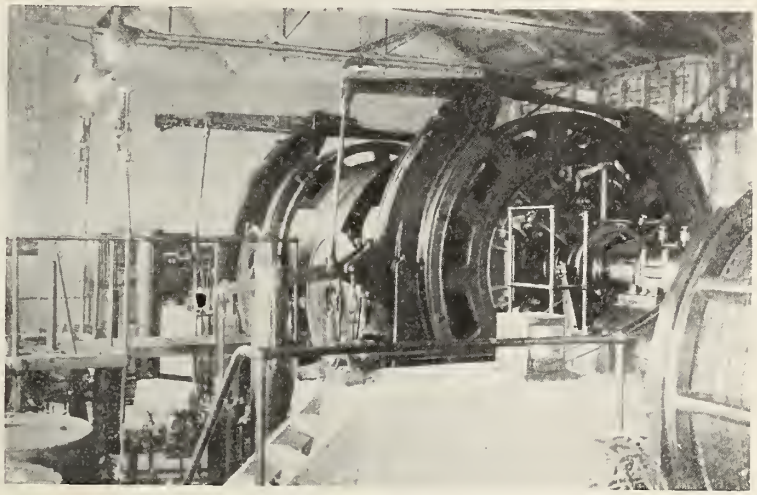
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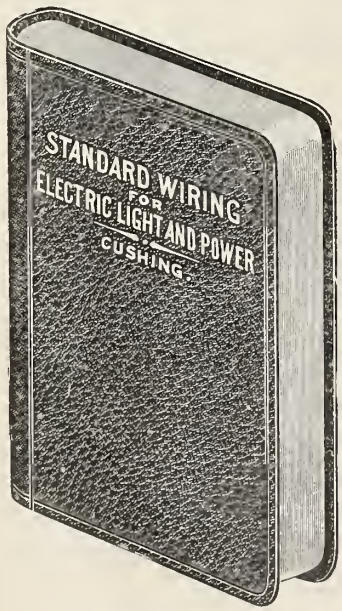
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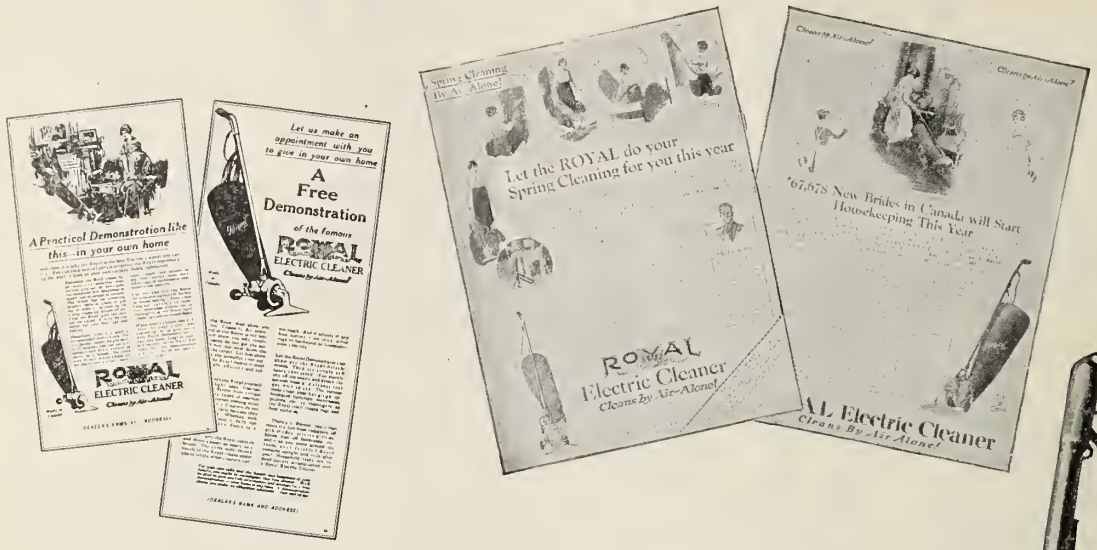
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Vol. 32 November 1, 1923 No. 21

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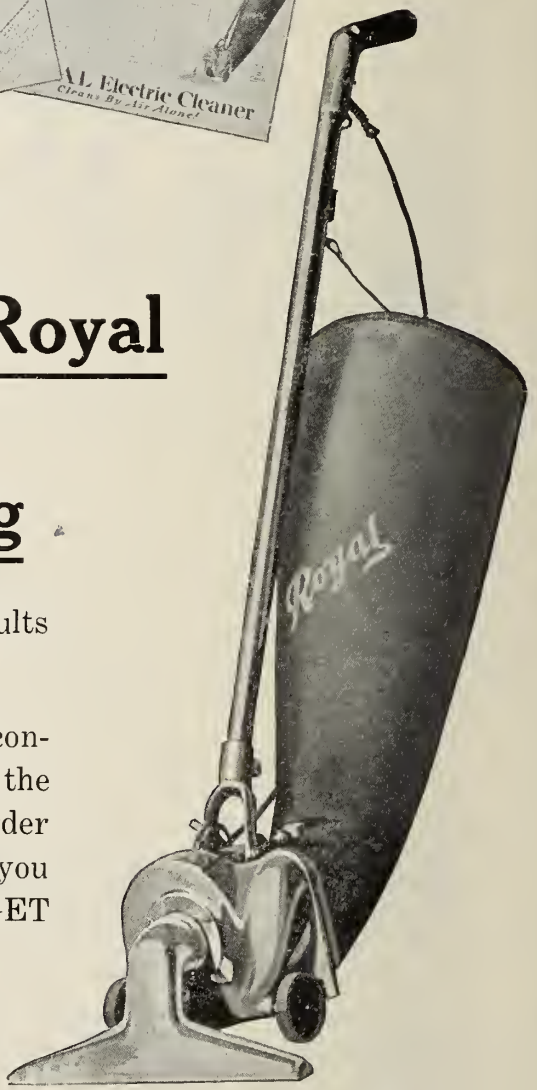
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"Hard to compete against—Easy to Sell"

ELECTRICAL NEWS

·DEVOTED TO THE INTERESTS OF
A UNIFIED ELECTRICAL INDUSTRY

First Winnipeg Electric Home

Creates Big Demand for Better Wiring

Among Public, Who Responded Quickly to Demonstration, Staged by Manitoba Electrical Association—Second Home Now Contemplated

The first Electric Home has proven to be a success in every way, as shown by the final reports submitted to the Manitoba Electric Association at their general meeting, Thursday, October 4th.

The Home Committee, under the chairmanship of Mr. George R. Wright, manager of the Canadian General Electric Company in Winnipeg, submitted their various reports to the general meeting of the Manitoba Electric Association, Thursday, October 4th, and it is interesting to note that in summarizing the work of the various sub-committees, Mr. Wright very strongly recommended further activities for the Electrical Association, along the lines of following up the good work accomplished by means of the Electric Home.

The Home, which was officially opened by Premier Bracken on Aug 18th, was on exhibition for two weeks thereafter, staffed by a group of 97 demonstrators, and under the chairmanship of Mr. A. McFadyen, manager of the Standard Underground and Cable Company, Winnipeg. The staff of demonstrators was drawn from all of the electrical wholesale and retail establishments, as well as the central station groups, and was made up of employees from every part of these various organizations.

It is interesting to note that a surprising amount of sales ability was discovered among certain of the demonstrators who had never had previous experience in demonstrating or otherwise offering electrical goods to the public.

A record of attendance at the Home was kept by means of a turnstile through which the public passed into the Home; to each was given a souvenir booklet.

The Manitoba Association of Architects, headed by their president, Mr. Northwood, visited the Home in a body and showed great interest in the scheme. F. T. Shipman and W. Sibbald of the MacDonald & Willson Lighting Company and the Sibbald Electric Company respectively, distinguished themselves by the able manner in which they described the purpose of the exhibition and the electric appointments of the Home to the architects.

The publicity work in connection with the Home deserves particular mention ,great credit being due to H. C. Howard and W. T. King, of the Winnipeg Electric Railway and Winnipeg Hydro-electric System respectively, for the very able manner in which they put across the message to the public. In addition to special street car and window cards and a wide newspaper publicity campaign, the two central stations co-operated to the fullest extent in giving ample space in their two publications going out to all customers as well as using specially prepared envelopes, and the Winnipeg Hydro donated a handsome painted billboard located on one of the prominent corners of the of the best residential district.

The contractor-dealers, through window displays and other activities worked in close co-operation with the Results Committee, and one of the best indications of the success of the Home is found in the fact that practically every retail electrical dealer in Winnipeg is able to trace certain new business directly to the Home Exhibition, and the public interest in convenience outlets which the exhibition created.

Plans are being prepared for following up the convenience outlets phase of the publicity in a co-operative advertising scheme to be participated in by all contractor-dealers; also for a better store lighting campaign, in which the electrical dealers are showing a very active interest.

Already there is considerable discussion about "Our next Electric Home," and it is believed that the retail electrical merchants of Winnipeg are prepared to make it even bigger and better than their first, which has just been so successfully staged.

The Electric Home described above is illustrated on page 41

G. W. Austen Speaks at Meeting of Toronto Contractor-Dealers

An opening meeting of the electrical contractor-dealers of the Toronto District was held on October 9, in Hunt's.

After partaking of a good dinner, the meeting was opened by L. E. Flewwelling. He introduced the speaker of the evening, G. W. Austen, of the Electric Service League, who explained to the meeting that the object of the League was a continuous campaign to improve the use of electricity in the home. This purpose is to be accomplished by many forms of propaganda. Mr. Austen stated that a special Christmas campaign embracing the use of billboards, posters and other matters will be used to push the electrical Christmas idea. He outlined part of the 1924 program so far as it has been arranged. This includes Electric Homes, Electric Week, June Bride, Red Seal, Educational and other seasonable campaigns.

Some discussion followed the lecture by Mr. Austen, centering mainly on requirements of capacity for the service of a Red Seal Home.. It was finally determined, however, that the present arrangement provides for what we may expect in the future, i.e., a much more highly electrified community.

Other features of the evening were the report of the Licensing and Merchandising Committees. A committee consisting of Messrs. Clark, Rohleder, Cheevers, Drury and Newman was appointed to bring in a report on the exact cost of wiring ranges. Several new members were received into the association.

Profit with Daily Turnover

The folowing letter touches upon a topic that may be of interest to other readers. We reproduce it in full:

Editor, Electrical News:

Dear Sir:—

In your issue of October 15 you printed a statement about turnover that I don't see how you arrived at. It was given on page 45, under the heading "Turn It Over," and said that a merchant starting business with a stock of $1000 and turning it every day at a margin of 1 per cent. for 300 days would have a gain of 1876 per cent. at the end of the time. Will you please tell me how you figure this out?

Yours truly,

C. Y. D.

The figure given in the item referred to, 1876 per cent., is correct. It is understood, of course, that the increase of one per cent. per day, is added to the original stock. Thus at the end of the first day the merchant has his original stock of $1000 plus an increase of 1 per cent. or $10.00, making a total of $1010.00. At the end of the second day he has this $1,010.00, plus an increase of 1 per cent., or $1,020.10.

To figure it out in this fashion for the whole 300 days would take a lot of time, however, and there are many chances of arithmetical mistakes. The short cut by which the answer is obtained involves the use of algebra, and we give it herewith, for the mathematically minded:

The increase of one day's business is one per cent., or one hundredth. Then if the capital at the beginning of a day be written as 1, at the end of the day it must be written 1.01.

This increase of 1 to 1.01 takes place 300 times, each increase being calculated on the previous day's increment, as well as the principal. Thus the final sum is equal to $(1.01)^{300}$. This is most easily reduced by taking the logarithm of 1.01 and multiplying by 300. This multiplication gives the logarithm 1.296, representing the number 19.76. Hence $1,000 at the beginning of the 300 day period would become $19,760. This is an increase of $18,760 over the initial stock of 1000, or 1876 per cent.

Business Changes

W. R. Murphy, Ogema, Sask., has sold his electric plant to J. C. Fish.

The Laval Radio Company has been registered in Montreal.

The Ethier Electric Shop has been registered in Montreal.

The City Battery and Electric Co., Saskatoon, Sask., has succeeded the Saskatoon Storage Battery Company, Ltd.

The Plateau Electric Repair Shop has been registered in Montreal.

The Annex Radio Supplies has been registered in Montreal.

Industrial Management, Limited, has been incorporated with a capital of $100,000, to manufacture and sell electric power, and is licensed to carry on other undertakings, in various parts of Quebec. Head office, Montreal.

The Hydro Commission of Napanee, will take over the electrical business of E. L. Burns on St. George St. on Nov. 1, 1923.

Thos. J. Strachan, 712 Gladstone Ave., Toronto, is opening a new store, handling mainly electrical fixtures, at 423a Yonge Street.

St. Boniface, Man.

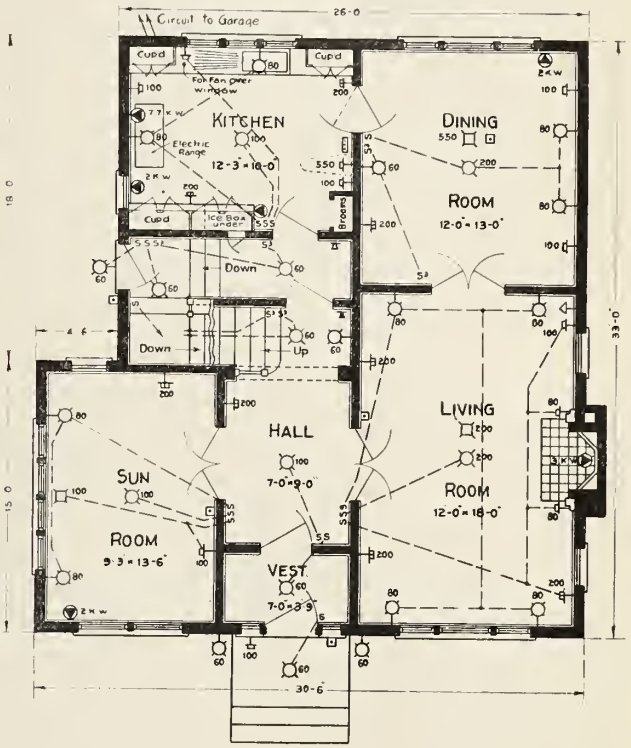
Levvy Electrical Co. Ltd., of Winnipeg, have secured the contract for wiring the new Provencher school. Standard Underground Cable Co. of Canada, Ltd., have the contract for underground wire.

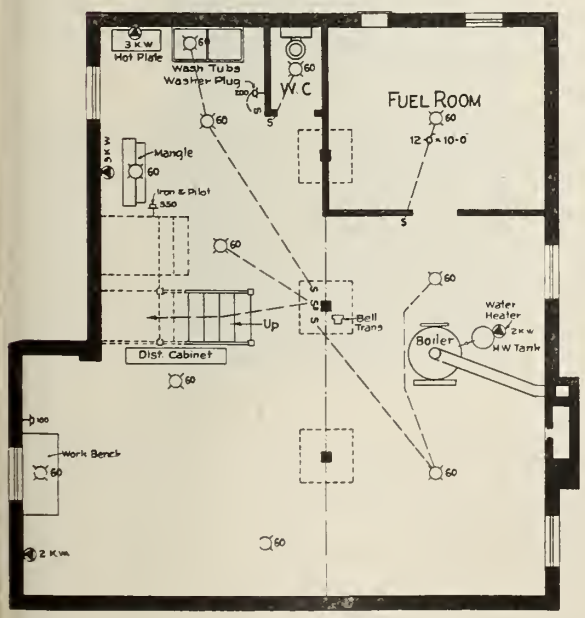
Winnipeg Electrical Men Know How

Tangible Evidence of an Aggressive Policy Shown by Winnipeg Electric Home



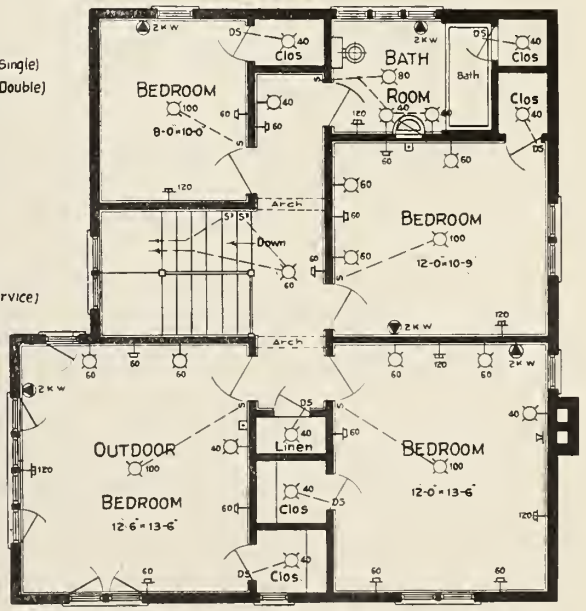
Over 20,000 people visited the home during the time it was open. Wiring was very complete, anticipating present and future needs. Service was 110-220 volt, 3 wire, of three No. OO cables, load being controlled by 400 ampere externally operated switch.





SYMBOLS

- Ceiling Outlet
- Convenience Outlet (Single)
- Convenience Outlet (Double)
- Wall Bracket
- Heating Outlet
- S Single Pole Switch
- S³ 3-Way Switch
- DS Door Switch
- Floor Outlet
- Push Button (Bell)
- Telephone (Private)
- Telephone (Public Service)
- Bell Transformer
- Radio Plug
- Annunciator



Canada Well Represented at Recent International Convention in U.S.

Debate Re Separating Merchandising and Contracting—Canvassing Necessary to Sell Appliances—Insurance Rates and Electrical Work

One of the most striking features of the convention of the International Association of Electragists which was held in Washington recently, was the large number of Canadians present. Among these were Messrs. Moss, Gray, Hicks, Davenport, Stewart, Peasnell, McHenry, and several ladies. There was a total of eleven Canadians there throughout the convention, and Mr. Beard, of Budden-Beard Company, Calgary, was also on hand for a short time.

The substance of the following account of the convention was obtained from Mr. Gray, and he states that while it touches on the high lights of the convention, he has neglected the smaller matters in the belief that howsoever interesting they might be to those present, the larger body of members will be interested mainly in the outstanding events.

A debate on the question as to whether the best results are obtained by a combined contracting and merchandising business provoked much discussion. The two principal debaters, M. H. Johnson and Louis Kalischer, both had strong points. Mr. Kalischer stated that he had given the combined contracting and merchandising business a good tryout, using modern methods to the best of his ability and he claimed that he lost money. He had a good store on a good street and kept his books in good fashion.

Mr. Johnson, of Utica, claimed that these two lines of the electrical business can be combined profitably. He gave his experience and argued that Mr. Kalischer had not run his business according to the lines which others had found successful. The judges brought in a verdict on the affirmative side of the debate.

Mr. Gray states that the general feeling of the convention was that in the smaller places there could be no doubt as to the advisability of the combined business, but the question had a different aspect when considered in regard to the larger cities.

A paper on appliances brought on a discussion along the same line as the debate. One dealer told how he did business by canvassing and pointed out that it was the hardest thing in the world to get people to come down to an electrical store, but canvassers could dig up business. It was pointed out that there was considerable loss in servicing appliances.

There was a debate on the question as to whether a super-standard installation should reduce the rate of fire insurance on buildings. It was pointed out that other hazard reducing equipment such as fire doors, wire glass, sprinkler systems and so on, was taken into account by the Underwriters and resulted in a reduction of insurance rates. Against this, however, it was pointed out that purely electrical fires are only a small percentage. The suggested improvement in installation was to have all work in metal conduits. It was pointed out that this was not desirable in some cases, as in packing houses and breweries, where the knobwork gave a desirable air space to the wiring.

The convention was a real eye opener to those gentlemen whose wanderings have never carried them north of the Canadian boundary. The Canadians at the convention were as big a percentage as from any United States cities, except perhaps New York. They sat together at the dinner-dance and impressed upon the minds of the gathering that they were there, by giving, under the leadership of Mr. Gray, an improvised yell consisting of the old Varsity slogan slightly remodelled to fit the occasion.

The Electrical News has also received comments on the convention from others who were there, all stating that they had a thoroughly enjoyable and instructive time. Mr. G. W. Moss points out that our inspection in Ontario is greatly superior to anything obtaining in the States: in that country contractors often have to wait for several days to have their work inspected. He says that his impression was that everybody at that convention really wanted to do a better class of electrical work and he feels that this movement will ultimately become universal with consequent improvement to the electrical business. Harry Hicks and George Davenport also reported a good time with a couple of broken automobile springs the only fly in the ointment.

Contractors-Dealers Assemble November 26

The one day session of the International Association of Electragists will be held in Toronto on November 26. It will be noted that this date, the 26th, is a Monday and that the previous item in the Electrical News stating that the convention was on the 27th, was in error. In the afternoon, Laurence W. Davis, and possibly Miss Carroll of the Society for Electrical Development, will speak. In the evening an attractive program has been arranged when James R. Strong, president of the association will be present. A large attendance of electrical men is desired, whether or not they are members of the association.

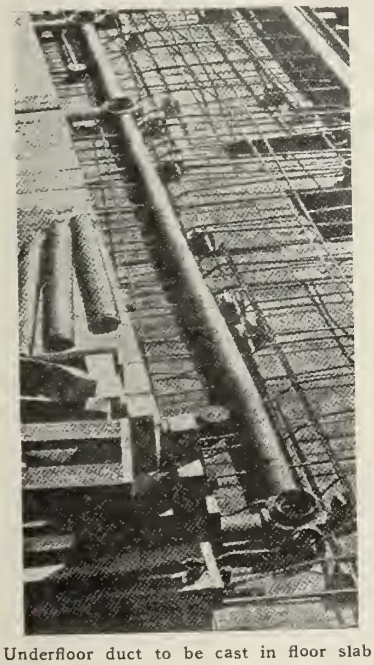
Industrial Management, Ltd., 222 St. James St., Montreal, have been incorporated with a capital of $100,000 to distribute electric power.

New Electric Distribution System

Method Claims Great Flexibility Providing for Future Additions to Light Power and Signal Circuits—Uses Fibre Duct Placed in Floor Fill

A relatively new underfloor distribution system affording great flexibility of distribution at low cost, has been recently described. Records of bids on the electrical work for 22 buildings ranging in cost from $100,000 to $15,000,000, indicate that, despite the density of floor distribution, the average cost for this underfloor system was only 0.64 per cent. of the building cost. This economy is claimed to be due to the low unit price of the material used, and the ease of installation. The following description is condensed from an account appearing in the Electrical World:

For years architects and engineers have been confronted with the problem of installing sufficiently flexible systems of floor distribution for light, power and signal circuits to care for future requirements. Of late the problem has been aggravated by the tendency toward open offices, with the consequent uncertainty of desk location, and by the need in industrial plants of changing motor locations or feeder circuits because of changes in production processes, new ideas in motorization and growth of industry.



Underfloor duct to be cast in floor slab

With concealed systems of distribution which have been used in the past it has been found expensive to provide a system that will adequately allow in advance for these changes. Consequently, when outlets had to be relocated it was often necessary to remove the floor covering, channeling the concrete to accommodate the new circuit or adopting some less desirable expedient.

In general, the new system consists of a grid, loop or any other preferred arrangement of half-round fiber ducts connected at intersections by junction boxes which are merely laid in position (not actually attached to the components of the system) and the whole incorporated in the floor fill so that outlets can be placed at the beginning or after the floors are completed. Either single-ducts or double-duct systems can be installed, depending on whether the electric power and signal circuits are grouped in the same duct or separated. If the latter is done, both types of circuits can be made available at closely adjacent points without the complexity of grid crossings by using interlocking grids, one for power and one for signal circuit.

Placing of the Ducts

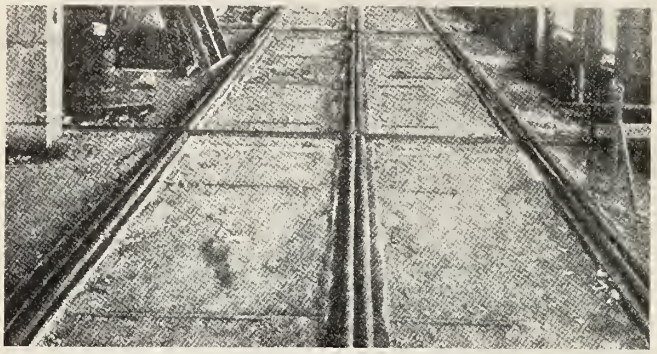
In this grid of underfloor ducts the backbone of each grid serves as a header, while the ribs or branch ducts at right angles to the header extend to the floor wiring centres. Access to the duct is obtained through inserts or outlets placed at the start or after the floor is finished. If placed first and subsequently abandoned they may be easily closed in a simple manner, being, however, immediately available again if wanted. Usually in laying out the system one duct is run parallel to the outside wall of the building, about 3 ft. to 3½ ft. therefrom, and other ducts laid parallel thereto at intervals depending on the flexibility of service desired. Maximum flexibility can be obtained by placing them 5 ft. apart because in this position any desk is bound to come over one of the ducts. Headers are spaced solely on the basis of estimated wire density (20 ft. to 40 ft. apart), as the wire can be snaked any distance met with in ordinary modern buildings.

It is the claim of the architects, engineers and contractors in favor of the system that it is adapted to any medium or high-class fireproof floor construction where there is sufficient fill for service systems installed in the normal way; that is, where there is 4-in. to 5-in. fill above the concrete slabs. In such cases the foreign piping must be installed below the upper 3-in. stratum to avoid cross-overs. Where this is impossible it is suggested that the foreign piping be moulded in the slab or grouped where possible and the concrete slab channeled to accommodate it. Where this is impossible special cross-under fittings can be used in connection with the underfloor duct system.

Keeping the Ducts in Place

To keep the ducts and outlet boxes in place awaiting the pouring of the floor fill various methods have been employed. For example, tie wires have been

cast in the concrete pads, plaster of paris or cement has been used to incase the ducts, but the most economical and desirable method is to pour hot roofing pitch along the edges of the duct and the junction boxes where they meet the concrete pads and over the joints between ducts and also where they join the junction boxes. When this pitch sets it holds the



Intermeshing double grid system

ducts and junction boxes very firmly in place and also serves to exclude moisture of the floor fill when it is poured. One contractor finds that 9.6 cents per lineal foot of duct is a conservative figure for laying the ducts and junction boxes, where boxes are placed every 40 ft.

If the floor outlets are installed in advance of the floorfill, the underfloor duct is tapped at the point where outlets are desired and the outlet is threaded into place and protected from injury. According to experience on actual installations, floor outlets have been installed in finished floors in twenty minutes. This includes the time of cutting the linoleum, drilling the concrete floors, cutting the fiber duct, screwing the outlets into place and grouting in position.

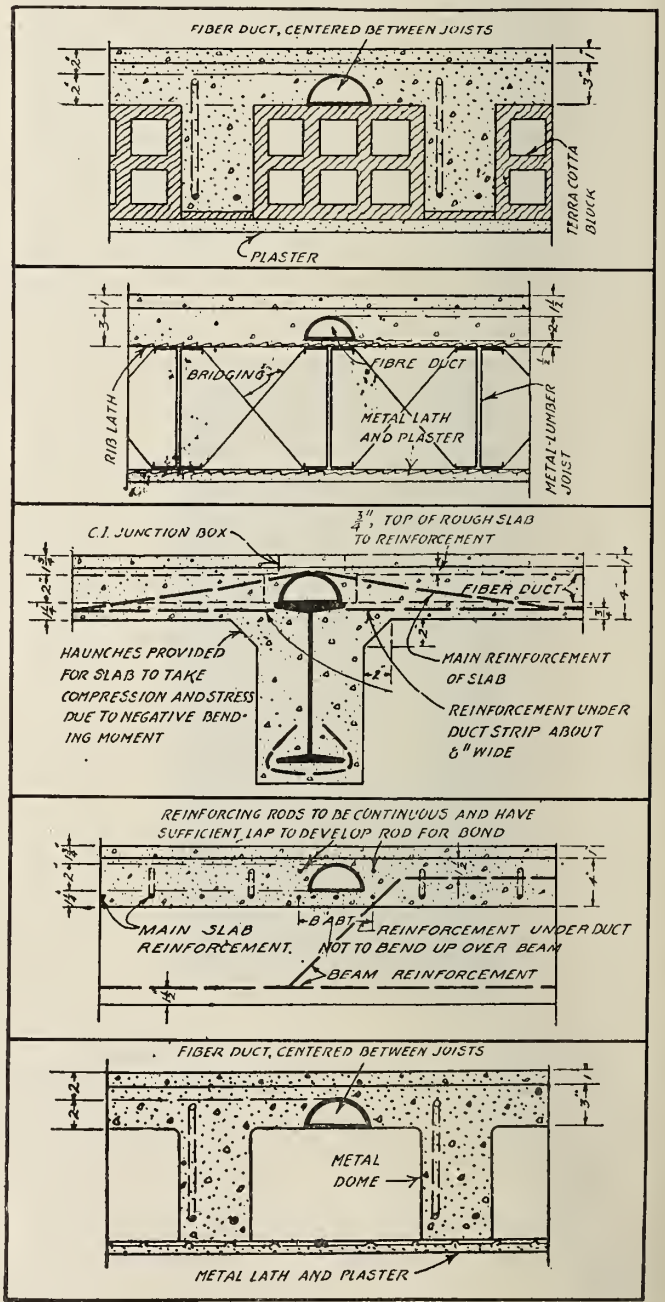
Before the floor fill is poured it is necessary to level the upper part of the junction boxes, which lie flush with the floor surface. This is relatively easy to accomplish because of the adjustment provided in the surface of the box, but it is the one job which requires the most skill. Some building contractors take advantage of these leveled outlet boxes for determining the surface of their floors.

Capacity of the Ducts

With a cross-section of more than 6 sq. in. in one of these half-round fiber ducts it is geometrically possible to accommodate as many as forty pairs of rubber-covered wires in one duct. However, this capacity, even if practically obtainable, is never needed in the most congested office buildings. Half-round 4-in. ducts are used in most cases to facilitate location of them after the floors are laid. Smaller ducts can be and have been used where desirable. In industrial plants where large circuits are required it is possible that ducts even larger than 4 in. might be provided. Because of the cross-section of the underfloor duct system, it is decidedly easier to fish and snake wires and cables than in systems of smaller cross-sections. Though no tests have been run to determine the maximum speed of installing wires, 100 ft. per hour have been easily snaked and pulled under normal working conditions. In one installation eight armored cables have been pulled into half-round 4-in. underfloor ducts, and it is claimed by some contractors that as many as ten can be pulled in without crowding the capacity of the duct. In another installation fourteen pairs of telephone wire and three forty-pair telephone cables were pulled into one duct.

Cost Figures

According to records of several contractors, the cost of installing this underfloor duct system exclusive of wiring is between 40 and 50 cents per lineal foot for single-duct systems. This is based on hav-



Five types of floor construction showing application of underfloor duct system

ing junction boxes about 40 ft. apart and on metropolitan conditions where the cost of a journeyman electrician and helper amounts to a little more than $1 per hour.

Objectives

The cost of the underfloor system is raised as an objection. From the costs which have been quoted readers can decide for themselves, remembering that this system is not advocated except where flexibility and congestion of service require that ducts be provided having capacity equal to or greater than that of two ¾-in. conduits.

Objection to running both power and signal circuits in the same duct is raised by some, but such construction is not necessary if the double-duct system is used. However, it may be pointed out that power and signal circuits have been installed in the same duct in at least one large installation. In most cases power circuits are run in armored cable, although one installation is now being made where ordinary rubber-covered wire has been allowed for both power and signal circuits.

Absence of a grounded inclosure for the circuit is advanced as an objection by some interests, but some representatives of the Underwriters have pointed out that the only reason the code requires grounding of conduits is that the conduit itself is a conductor and will become alive and constitute a life or fire hazard if a conductor comes in contact with it. In the underfloor duct system there is no metal inclosure, hence there is no need of grounding even if there were the opportunity. The same interests expect that the concrete inclosing the duct will be of as great protection against fire as metal conduits, if not greater.

Dr. Pirt's Western Electric Home

Specially Designed for Electrical Heating With Insulation in Walls—Temperature Automatically Controlled—Provision Made for Future Developments

While there have been several electrical homes built in Winnipeg of late years, these have been almost without exception of the bungalow type. The Home Electrical, described in this article, is the largest house, fully wired for electrical heating and domestic operation, yet erected in the city. It is wired to permit of the utmost possible use of power. All outlets have been placed with a view to ultimate use and convenience and they are sufficient in number to take care not only of immediate requirements, but any future developments in electrical home equipment.

It is stated by the architect, D. W. Bellhouse of Winnipeg, that every phase of its erection was planned for electrical heating and operation. In an ordinary house electrical heating would be far from economical but this building has been designed for this purpose and is insulated in every possible way against the passage of cold air from the outside. The insulation used throughout is Sealofelt which was selected as possessing the qualities which make perpect insulation a possibility. This insulation is made at Selkirk, Man., from locally grown flax straw. It comes in sheets 32 and 36 inches wide for flat application, and in 16 and 24 inch sheets for nailing between rafters and studs. The material was selected as best suited for the insulation of this house after tests and investigations of many other insulating materials. It is said to be flexible enough to stand shrinkage and settling of buildings, and will neither crack or break. Its use under the roof is a big feature of this house as it keeps upstairs rooms cool in summer and prevents the passage of heated air in the winter. The main essential of an electrical home is that to be economically heated the insulation must be perfect both in its type and application, and for this reason the material used was made a matter of close consideration.

An Artistic Design

The design of the house is perfectly plain inside and out. As one approaches at night the first thing to strike the eye is the porch, which is of a most graceful design and harmonizes perfectly with the house itself. The feature of the lighting arrangement in the porch is a recessed space in the ceiling which throws the light downward without glare.

The lighting arrangements of the living room are in the form of four handsome wall brackets controlled by a switch at the entrance to the room, while immediately beside this is another switch for a central luminaire. Two of the wall brackets are over the mantelpiece, while two others are adjacent to the built-in bookcases, which are part of this room.

The fireplace is an electrical one though it has been built so that it may be converted into a coal burning grate if necessary. Three other outlets are in the living room, two for portable lights and one for the vacuum or other purposes. A jack is also provided for connection with the telephone.

From the living room entrance is gained to the sun parlor which at night is beautifully illuminated by two wall brackets of the same design as those in the living room. Extra outlets are also provided, one being a plug for a reading lamp, another a convenience plug while a power outlet is installed for

Is Your Name On Your Last Job?



This photograph was taken during the construction of a large office building. It embodies a feature too often omitted, viz., the name of the electrical contractor. This is a cheap form of good advertising which it costs money to neglect

using a portable radiator for heating purposes should the main heating apparatus not be needed. This room also has a central luminiare controlled from a separate switch near the doorway. A feature of the sun parlor is the radio connection which makes it possible to use the radio in either the sun room or the adjoining living room.

Passing through the hall, which is lighted by one wall bracket and a central drop, and also has a fixture in the newel post, the dining room is entered. This is illuminated by a central dome and two wall brackets, one on either side of the buffet. A power plug is also provided for using a portable radiator, while a convenience outlet allows for a lamp or vacuum cleaner.

In the kitchen, which is 11 x 13, is a central drop. This is the main unit of illumination though there is a bracket over the sink. In an electrical home naturally the cooking is done on an electric range, and one is installed. Two convenience outlets are also arranged to take care of ironing boards and other appliances, while a jack permits of an extension from the phone being used in the kitchen.

Back Vestibule and Garage

From the kitchen a doorway leads to the back vestibule in which is built in a refrigerator partly in the garage and partly in the vestibule. The icing chamber is reached from the outer vestibule, which has one light drop and leads down five steps through a covered passage to the garage attached to the house. The garage is a double one for two cars, a plastered wall dividing the two sections. One half is heated by an electric radiator as it will be used for the winter car, though a power outlet is provided on the other side for heating purposes when required. In both portions provision is made for plugs for lighting and cleaning, though both have permanent illumination installed. All hot water needed in the house or garage is obtained from a boiler in the basement, this being heated by electricity.

From the second floor landing access is gained to a sleeping gallery which is enclosed on three sides by large windows. It is lighted by a central luminaire. There is also a power plug for a portable radiator in case heating is necessary, and a phone jack provides for an extension of the phone.

In the upper and lower halls are 3-way switches by means of which the lights can be switched on or off in the downstairs or upstairs halls. The main bedroom, 14 x 20 has two small ante rooms, one of which is to be used as a sewing room, and has a central drop, while the other is a dressing room with shelves and drawers built in, and has full length mirror in the door. There is also an electric fireplace in this room. It has four wall brackets while two ceiling outlets are also provided. These are all controlled from the entrance. There is also one convenience outlet, a plug for a radio and another for an extension desk phone.

The bathroom, which is 7 ft. 3 in. x 9 ft. 6 in. is wired for a central drop and a wall bracket on each side of the basin. A power outlet is also provided for using a radiator and one outlet for cleaning. The bath is built in as is the shower, and the basin is of the pedestal type. Just outside the bathroom are two built-in linen closets.

The second bedroom, 13 ft. x 13 ft., is lit by three wall brackets and a central light controlled by a switch just inside the entrance. A power plug allows for use of a radiator and a convenience outlet for the vacuum. A large linen closet and a cedar lined cupboard for storing furs are features of this room, a drop light being installed in each.

The third bedroom, 9 ft. x 13 ft., is illuminated by a central light and has a power switch for the elec-

tric radiator with a convenience outlet in the baseboard.

While this house has been provided with a central ceiling luminaire in each of the rooms, its owner prefers in most cases to eliminate this source of illumination and rely entirely on the wall brackets or portable lamps.

General Features of the Electrical Home

All mouldings were made perfectly plain with a view to eliminating lodging places for dust. The house was built especially with a view to electrical heating and has been insulated according to the most modern practice. Sealofelt has been used throughout both on inside of exterior walls and rafters, while the space between the studs and the ceiling rafters have been filled with mineral wool, approximately 3 1/4 pounds to the square foot.

The general construction is full sized concrete basement with waterproofed exterior. Dark red tapestry brick runs to the second floor with limestone trimmings while between the brick and the roof line is two coats of stucco. The entrance adds greatly to the appearance of the house. It is all Manitoba stone with brick coping, while the caps and steps are also stone. Ornamental flower boxes will run on both sides of the entrance and around the sun room.

In the basement is a door leading to the garage which saves walking through the house should it be necessary to use the auxiliary water heating system. All the hot water for domestic purposes is heated by a large electrically operated boiler.

Electrical Heating Equipment

The electrical hot water heating equipment of this home has been especially designed to be completely automatic and noiseless in its operation, and requires no attention on the part of the owner. A low rate for current is given for the heating. The central station has a four hour keep-off-the-peak restriction in the evening, and it was necessary to provide adequate heat storage capacity during this interval consisting of a 250 gallon enclosed tank with 20 kilowatt of immersion type heating elements.

220 volt alternating current supplies the elements and is carried through a magnetically operated switch, the solenoid of which is operated either by a 40-day time switch or a thermostat on the tank in the event of the water rising above 200 deg. F.

The clock is wound and set every 30 days by the central station meter reader so as to cut off the current at the predetermined peak hours.

An 8-day clock thermostat is installed in the living room to maintain an even temperature, and further, to automatically, at predetermined hours, cut the temperature down to 50 deg. during the night, and raise it to 70 deg. in the morning, through the operation of an electric motor and magnetically operated valve in the hot water supply line from the tank to the radiators.

A small auxiliary hot water boiler is installed in case of the electrical current supply failing at any time.

Electricity in Calgary Stampede

The city of Calgary, Alta, recently held a "Stampede Week." The program included a parade, and prominent in the parade was the Northern Electric Company's float demonstrating a Gurney electric range. This float took first prize.

The range was warmed up before the parade started and then switched over to a 110 volt Edison battery which was carried on the truck just beside the range. In this way about two thousand cookies were baked as the procession moved along; they were placed in small paper bags and thrown out to the people lined along the streets. This actual demonstration aroused a great deal of interest. In the float illustrated herewith, the range is shown rather indistinctly. The battery was placed between the range and the driver and kept out of sight.



Northern Electric Float in Calgary Parade during "Stampede" Week

Fine Electric Show Stirs Border Cities

Paid Admission Proved Profitable—Thousands Packed Armouries Every Afternoon and Evening—A List of Exhibitors

During the last week in September the electrical interests in Windsor and Walkerville put on an "Electric Show." The results are being felt in increased sales. One manufacturer reports that in the two weeks following the "Show" one hundred of his electric ranges were sold. In many directions there is evidence that the general public is now very much more interested in electrical appliances than before the exhibition.

The event was financed and staged by a "League" composed of the two Hydros and the contractors and dealers of Windsor and Walkerville. Assistance was also given by manufacturers to the dealers who were exhibiting their goods. In all there were some forty of as attractive displays and demonstrations of electric goods as were ever shown in Canada. The Windsor armouries was full to overflowing of electrical enthusiasm. The citizens of the Border Cities—from both sides of the river— packed the building, every afternoon and evening. A small fee was charged and the result was a nice surplus over expenditures.

There are some very fine electric stores in Windsor and Walkerville where the combined population is now well past the fifty thousand mark. Indeed, the infrequent visitor is quite unprepared for the many changes and improvements that have taken place during the recent past. Both cities have some very beautiful streets and very modern and efficient examples of street lighting. The same is true of the public buildings, a splendid example of which is the Windsor-Walkerville Technical School and the new Walkerville Collegiate. In solidarity, external attractiveness, interior appointments, fittings and illumination, it is probably within the mark to say there is nothing finer in schools in the Dominion. Both M. J. McHenry and O. M. Perry, the Hydro managers respectively in Walkerville and Windsor, are members of the School boards, Mr. McHenry being chairman in Walkerville.

The exhibitors at the Electric Show are given below. They were all there. There are no drones in the electrical business in the Border Cities:

Brantford Washing Machine Co.; Maxwell's Ltd.; F. D. Reaume; Hurley Machine Co.; Canadian General Electric Co.; Gilbert Campeau; Beatty Bros.; National Electric Heating Co.; Canadian Westinghouse Co.; McNaughton & McKay; Hoover Suction Sweeper; McClary Mfg. Co.; Bowlby & Glunns; Northern Electric Co.; Masco Co.; D. Moore Co.; Baum & Brody. Johnson-Turner Electric Repair; Barton-Netting Co.; Wesley Electric & Supply; Windsor Hydro; Walkerville Hydro; Good Housekeeping Shop; Moffatts Ltd.; Ingersoll Machine & Tool Co.; The Electrical Shop; Automatic Electric Heater; Dalyte Electric; Durable Electric Appliance Co.; Coffield Washer; Canadian Ironing Machine; Kribs Mfg. Co.; London Metal Products; Easy Washing Machine.

Power Company Backs Up Dealers

The Jamestown (N.Y.) Electrical Contractor and Dealer Association has worked out a unique plan of co-operation with the local central station which has been productive of much good for all concerned. The local utility, the Western New York Electric Company, does not merchandise electrical appliances, so has leased its display window, located on the main street, to the members of the association for the showing of their goods. The background of the window has been decorated attractively and contains the names of the ten members, and every tenth week each member is entitled to the exclusive use of the window to display his goods, the name of the member showing being placed in the foreground of the display. A splendid spirit of friendly rivalry has been the result of this activity, each member vieing with the others to produce the most attractive displays. The central station furnishes, free of cost, the current for lighting the display and operating the appliances when required, while the members of the association attend to the cleaning of the window, setting up the exhibits, etc.

Station WBE to Give University Extension Course by Radio

In order to further extend the use of radio so that it may be put to utilitarian uses, Westinghouse Radio Station WBE at Springfield, Mass., has arranged with the Massachusetts Division of University Extension for a number of courses in which the successful student will obtain a certificate of perfection at the completion of the course. Two courses have been arranged at the beginning—one on radio intended primarily to interest men and boys, the other on household management intended to interest women.

Live Displays in Windsor Armouries

Ever Spreading the Electrical Idea



The top photograph shows an attractive booth by the Canadian General Electric Company. In the centre we have an example of the displays that were put on by retail firms, second to none. This was staged by the Barton Netting Co.



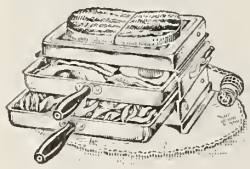


To the left is the well planned booth which was maintained by the Canadian Westinghouse Company.

The Latest Developments in Electrical Equipment

White Cross Luncheonette

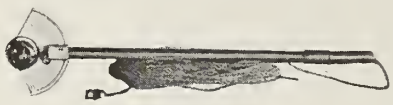
The accompanying illustration shows the White Cross Electric Luncheonette, marketed by the National Stamping and Electric Works, Chicago. This device has four heats, high, medium, simmering, low. It



cooks above and below the heating coils at the same time, and is attractively finished in nickle plate, trimmed with black ebonized handles and feet. It is furnished with cord with separate plug. Attaches to any lamp socket.

Electric Hedge Clipper

A novel electric hedge clipper is being manufactured by William H. Trowbridge. It is equipped with a 1/36 h.p. universal motor, 5,000 r.p.m., saw steel blade, wood handle, usually 3 ft. long, may be had longer for high hedges, trigger switch in end of



handle near operator's trigger finger, ball bearing on blade end, 100 ft. wire on each machine. It cuts on the flying blade, slightly on a slant, like a scythe, which is better for plants than a straight across cut. It is claimed to be not only good for hedges, but for all green growth such as grass around trees, fences, etc., and vines.

New X-Ray Reflectors

A short time ago when the lamp manufacturers brought out their new P-19 bulb Mill type Mazda



"B" lamp, which is a very sturdy round bulb design lamp, to be used where there is a jar or a vibration. The National X-Ray Reflector Company brought out three new reflectors to meet the demand of this lamp. They are the Mill, catalog No. 3, the Scoop Jr., catalog No. 7 and the Hood Jr., catalog No. 11. The Mill reflector is the smallest industrial reflector made. It is of the Beehive design and gives a very efficient light distribution for localized lighting such as over drafting tables, or machines of all kinds. The Scoop Jr. reflector is similar in design to the large Scoop No. 778 reflector and is designed to light deep show windows less than five feet high. The Hood Jr., catalog No. 11, the smallest of the new reflectors is very similar in design to the larger Hood. This reflector is designed primarily for lighting shallow windows less than five feet high.

Porch Lighting Bracket

Novelty Lamp & Shade Company has brought out a porch lighting bracket, the design of which is in Gothic style and which has a pleasing appearance. It



is intended for use with small lanterns and a number of lantern designs for use with this bracket have been worked out. It is known as the "GB" bracket. The appearance of the bracket is shown in the accompanying illustration.

The Walker Electric Dishwasher

The Walker Electric Dishwasher as illustrated, is a small portable machine for homes, tearooms, board-



houses and similar institutions, where not to exceed forty people are served at a meal. Being mounted on

casters, it can readily be moved from some isolated location up to the kitchen sink during the dishwashing operation. It has a small electrical centrifugal pump mounted on the rear, which operates by touching a switch, thus draining the water from the machine up through a swinging arm into the sink. The machine is but 32 in. high by 20 in. in diameter, and operates on a standard lamp socket outlet. The container of the machine being round, is absolutely free from corners to obstruct grease and food particles, and, being built of copper, tinned on the inside, is absolutely non-corrosive.

Ohio Vacuum Cleaner

The United Electric Company of Toronto, Canadian manufacturers of the Ohio Vacuum Cleaner, have placed on the market the new No. 5 model portable Vacuum Cleaner. The new machine embodies a number of detail improvements, besides some new features, principal among these being the new self-feeding bearings which are so constructed that an oil reservoir surrounds each bearing, the oil in turn being fed to the shaft of the armature through a special porous plug which allows only enough oil to ooze through to keep the shaft constantly lubricated. Another feature is the new spiral brush and brush drive. The wire lacing ordinarily used for constructing brushes of this kind, is entirely eliminated leaving a smooth spindle which prevents the twisting around of lint or litter which is swept up. The new self-lubricating vulcanized surface wheels allow the machine to run easier and silently. Another feature is the new automatic switch which automatically stops and starts with the action of the handle. The Ohio Machine is distributed in Canada by the Northern Electric Company, Limited.



The Elverson Oscilloscope

The Elverson Oscilloscope is a practical instrument which has developed from the well known principle of the Stroboscope, and is adapted for the critical observation of parts of all kinds of machinery while in motion. The apparatus consists essentially of a Neon electric lamp, the light from which is focussed upon the particular moving part under observation, whereby the part can at once be observed as if it were actually in a stationary position, or rotating, reciprocating, or otherwise moving, at a very slow rate of speed. The lamp is supplied with current by an ordinary 4-volt accumulator through a high tension transformer, and arrangements are provided whereby one, two, or four instantaneous flashes of the lamp are obtained per cycle of movement of the part.

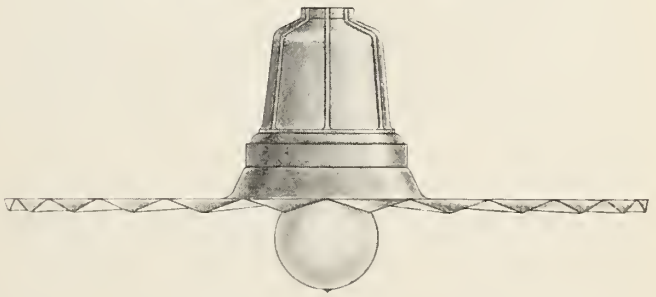
The apparatus is manufactured by Herbert Kennedy & Co., Ltd., 47, Victoria Street, Westminster, London, S.W. 1, who will be pleased to furnish the fullest particulars possible to interested firms overseas.

Over Million Dollars Worth of Electrical Equipment Ordered for Japanese Earthquake Zone

The Westinghouse Electric International Company has received orders for electrical apparatus to be used in reconstruction work in Japan totalling well over a million dollars. Other orders are in course of negotiation which will bring the total amount to approximately two million dollars.

Two of the highest Westinghouse officials, General Guy E. Tripp, Chairman of the Board, and Layall A. Osborne, president of the Westinghouse International Company, left for Japan on October 4th. They sailed from San Francisco on October 10th in the S. S. "Shinyo Maru," and will visit Shanghai, Hongkong, Pekin and the Philippines.

Street Lighting Unit by Winter Joyner Co.



Under the title "How an Entire Industry was Improved," an interesting booklet has been published by Good Housekeeping. It exposes some of the more common fallacies of electrical advertising and manufacturing.

Current News and Notes

Bowmanville, Ont.

It is stated that the tracks of the new C. N. R. electric line betwen Toronto and Bowmanville will be laid before the snow flies.

Brussels, Ont.

Ratepayers of Brussels, Ont., recently voted in favor of Hydro service.

Brandon, Man.

An important extension is being planned for the Manitoba Power Co., a transmission line from the plant at Great Falls to the city of Brandon, to which it would supply power and light. An offer has been made to the Provincial Government to lease the Government owned lines in the Province.

One of the first powdered coal plants in Canada for the generation of steam was started recently by the Canada Gas and Electric corporation. J. B. Harvey is manager of the plant. It is the intention of the company to burn lignite screenings from the Bienfait mines to start with and later on, Drumheller screenings will be used.

Bridgetown, N. S.

Citizens of Tupperville and Centrelea have made arrangements with the Bridgetown Electric Light Heat and Power Co., for the extension of service to take in Tupperville and Centrelea and steps are rapidly going forward toward having lights put into the various houses and other properties.

Calgary, Alta.

Six thousand miles from Calgary H. W. Soase, of Durham, England, heard the broadcast of the service of Grace Presbyterian church in Calgary, which was broadcast over CFCN on Sept. 29.

Two way communication with radio station WNP, the set on board the Bowdoin, the ship chartered by the McMillan Arctic exploration party, which is now some 2,000 miles north of civilization within the shadow of the arctic circle, has been established by W. W. Grant, of station CFCN, at Calgary. This is the first time WNP has been intercepted by a Canadian station.

Chatham, Ont.

J. D. Ross, formerly of Chatham, is superintendent of lighting on the Skagit River development, near Seattle.

An extension of about a third of a mile of hydro line will be made in the Fletcher district along the Raleigh-Tilbury town-line. Work is expected to commence at once. The extension includes a strip north and south from the M.C.R. tracks and will furnish power to five rural consumers to the south of the track and a number on the north.

Campbellton, N. B.

J. C. Chatterton is general contractor, and R. J. Sly, engineer, on a dam and pipe line for town council of Campbelltown, N. B.

Dawson City, Y. T.

Wireless telegraph stations at Dawson and Mayo, a part of the great system planned by the Government to link up the vast northland with the other positions of the Dominion, were opened to business on Oct. 20. These are the first radio posts established north of Edmonton. For the present the Government telegraph land line forms the connecting link between Dawson and the outside world.

Galt, Ont.

At a recent meeting of the local public utilities commission, the Ontario Hydro Power Commission recommended that the capacity of the existing circuits be materially increased as the 2,200 volt feeders now in use are overloaded. It was also suggested that another 13,000 volt substation be erected at the north end of the city.

Halifax, N. S.

J. Fossett, amateur radio enthusiast, whose station 1 AR located at Woodside, stated he had been in "two way" communication with Donald B. MacMillan's ship the Bowdoin, in the Arctic twice on July 11, at Battle Harbor, and on July 15, at Grady Harbor, Labrador.

Hamilton, Ont.

Contracts for the manufacture of equipment for the new Hamilton, Ont., Hydro sub-station on Beach road were recently awarded. The work will be done by the Westinghouse company, and will be all done in Hamilton. The cost is about $90,000.

Officials of the Hydro department are now working on specifications for the placing of the wires in the center of the city underground. Several weeks ago, the city council approved the expenditure necessary for the burying of the city's fire alarm wires and the erection of several new boxes.

Harriston, Ont.

Harriston council has granted $5,000 for the purpose of extending the hydro service.

Jonquiere, Que.

Wm. Hamilton Co., 479 Reid St., Peterboro, Ont., are supplying turbine for extension to hydro-electric development at Jonquiere, Que.

Kitchener, Ont.

The Kitchener Light Commission has taken over the Waterloo-Wellington Railway, which operated between Kitchener and Bridgeport. The commission

announced that two one-man cars of the latest designs have been ordered.

On Oct. 22, the Kitchener Light Commission decided to ask the commissions in other Hydro municipalities in the district to support a memorial to be submitted to the Ontario Hydro Pewer Commission, asking that body to discard the present system of charging domestic consumers for power and substituting another one. The Kitchener Commission proposes that the system of having an area charge in residences be discarded and be replaced by an installation charge which would vary according to the size and number of the ampere wire in the installation box.

Lynden, Ont.

The Ontario Hydro-electric commission have begun operations on the new rural power line from Lynden to serve the Troy-Sheffield district.

Langley Prairie, B. C.

.. Two new pole lines for electric power have been put in recently in Langley municipality by Jos. Gibson, Langley Prairie electrician.

Montreal, Que.

Work has been started on the plant of the Laurentian Hydro-Electric Co., and that it is expected power will be on January 1, 1924. The company has secured ten exclusive franchises for a period of ten years for furnishing power and light to towns and municipalities, including the following: St. Shawbridge, Ste. Adele, Val Morin, Ste. Margaret's, Lac Masson and Val David. The development is on the east branch of the North River about 45 miles north of Montreal in the Laurentian Mountains. It is proposed to instal an initial unit of about 2,000 horse power.

Oakville, Ont.

Oakville and Trafalgar Utility Commission is making rapid progress with the installation of the electric light and power lines into the township of Trafalgar.

Ottawa, Ont.

After thirty-three years service with the Ottawa Electric Company and its predecessor the Chaudiere Electric Light and Power Company, Mr. P. M. Grimes has retired to devote his time in future to the business of the Eclipse Plating and Sales Company. Before he left the Ottawa Electric Company offices for the last time he was given evidence of the regret that his departure caused among his co-workers. Mr. A. A. Dion presented Mr. Grimes with a solid gold watch, engraved and monogramed on behalf of the staff of the companies, who were assembled at the presentation.

Pickering, Ont.

A meeting was held recently in the town hall to discuss plans for the introduction of Hydro light and power into Pickering. The provincial Hydro Commission is being asked for an estimate for power supply for lighting and power.

Port Lambton, Ont.

A new hydro line is being erected to supply Lambton with power from the power house on the lower Snye, which will also supply Sombra. The new line will extend above Sombra for about four miles connecting with the line coming from the north.

Quebec, Que.

In accordance with its policy of allowing water powers to be developed whenever possible the Government offered on lease by auction three groups of rapids situated on the Megiscane River, in the county of Temiskaming. The upset price had been set at $4,000 annual rental, to be paid by the successful bidder, and L. N. Huard, of Levis, was the only one to bid, obtaining the lease on the first bid of $5 over the upset price. It is stated that there is over 15,000 h.p. available.

Contract for the construction of dam on the Metis River, Matane county, was awarded by the Quebec Running Streams Commission to Newton Dakin Construction Co., of Montreal, at $109,557.

The Quebec Power Company have announced that ten new cars of the one-man type are expected from Boston during the present month. Orders have been placed at Ottawa for the construction of another ten cars.

An interesting account of the water powers of the Province of Quebec, was rendered to the members of the Rotary Club recently, by Mr. Arthur Amos, chief of Hydraulic Services under the jurisdiction of the Running Streams Commission.

A contract which has been awarded by the Port Neuf Hydro-Electric Co. to Canadian Vickers, Ltd., Montreal, for 4,000-h.p. hydraulic turbine, includes installation complete with governor and all accessories and supervision of erection. The turbine will be of Francis type, with upright shaft in concrete spiral casing, designed for 360 r.p.m. and 64-ft. net head.

St. John, N. B.

The St. John Civic Hydro Commission established a record in line construction when the Musquash power supply was curtailed recently at 6 o'clock one afternoon, a start was made on the erection of a line nearly a mile in length, to connect with the McAvity Power House, where arrangements had been made to obtain power. At four o'clock the next afternoon the line was completed.

The St. John Marine and Fisheries department contemplate installing a separate light unit in the fire alarm building at Partridge Island and will convert the oil coast light of the Island to one operated by electricity. This is reported to be the first installation of its kind in Canada.

Acting city electrician Cunningham of St. John, N. B., has notified the N. B. Power Co. to remove 250 service wires which were formerly connected with

houses which are now using hydro. The company will be asked to take down all "dead" leads.

Shaughnessy Heights, B. C.

Contract for installing ornamental lighting standards in Shaughnessy Heights, a suburb of Vancouver, was let by the council of Point Grey municipality on September 24 to the firm of Farr, Robinson & Bird of Vancouver at a price of $56,242. The work will not be proceeded with until the council has a favorable report on the sale of the bonds from its solicitor.

Toronto, Ont.

A. H. K. Russell, was recently appointed Canadian general manager of the American Radio Relay League.

On his return to Toronto, Mr. H. H. Couzens of the Toronto Transportation Commission stated that in the Old Land even the municipally-owned power is dear as compared with that in Toronto and sister municipalities. In one place the charge is 16 cents per kilowatt hour for house lighting, as compared with an average of perhaps 3 cents in Toronto.

Mr. G. A. Newman, 14 Furniss Avenue, Toronto, has now in hand several important wiring contracts. Among them is a 32 suite apartment building including electric ranges, on the corner of Carlaw and Danforth Avenues; the Acorn Bowling Club, Ltd., Danforth Ave. (electric fixtures), and a large residence on West and Nelson streets, Brantford, Ont., owned by Dr. Phillips.

Vernon, B. C.

A new generator is being purchased for Vernon, B. C. It will take the place of the one damaged by the bursting of a flywheel on one of the Diesels recently. Mr. Excell was thanked by council for his quick work in getting service restored.

Vancouver, B. C.

Edmund E. Walker, sales engineer, British Columbia Electric Railway Company, Vancouver, B. C., returned on September 15 from a four months visit to England. Mr. Walker addressed the Vancouver Electric club on impressions of his trip on September

Winnipeg, Man.

Extension of the Winnipeg Hydro Electric system's plans to instal electrical heating units in public buildings was endorsed at a meeting of the Public Utilities committee on Oct. 15, when a recommendation for installation of an electrical heating unit in the General hospital was approved for submission to council. The undertaking represents an expenditure of $100,000 for the Hydro, part of which will be paid back to the system by the hospital for the unit within the building, and part of which will be borne by the Hydro for conduit construction. In submitting his recommendation for the new development J. G. Glassco, manager, advised the committee this business would bring in a revenue of $47,000 a year for off-peak power.

The Electric Home Campaign held in Winnipeg the last week of August and the first of September, attracted 20,000 people.

Woodstock, N. B.

Mr. Walter E. Stone, who has been district superintendent of the New Brunswick Telephone Company for 16 years, has retired to enter business for himself. Mr. John Turner, district superintendent of Andover, will take over the superintendency of the Woodstock district.

Winnipeg, Man.

W. B. Hickox, manager of the National X-Ray Reflector Company, of Chicago, and J. A. MacDonald, manager of the Thermo-Electric Company, of Brantford, Ont., were recent visitors in Winnipeg and Western Canada.

The contract for three horizontal-shaft turbines and governors, which was awarded by the city council to Canadian Vickers, Ltd., Montreal, for erection in the municipal power plant at Point du Bois, includes supervision of the installation of the units. The turbines are resigned to operate under a head of 46 ft. and an output of 7,300 h.p., and with an anticipated output of 7,850 h.p., operating at 150 r.p.m. The governors will be of the Vickers Picard Pictet type.

Wiring Contracts Awarded

Cap de la Madeleine, Que.

Nap. Montplaiser, $8,000 garage.

Charlton, Ont.

Victor Bryce, $3,000 church.

Cochrane, Ont.

G. Reid & Son, $5,000 addition to hotel.

Collingwood, Ont.

Malcolm McGillivray, $4,500 house.

Hamilton, Ont.

Culley & Breay, collegiate.

Wood Electric Co., $350,000 Lister Bldg.

Albert Schwenger, school.

Kitchener, Ont.

C. Smith, $100,000 alterations and addition to House of Refuge.

Kapuskasing, Ont.

G. Reid & Son, Cochrane, $5,000 store and warehouse.

Leamington, Ont.

Kellow & Robinson, $5,000 house.

London, Ont.

Lavender Electric Co., $15,000 stores and apartments.

Mabou, C. B.

H. W. Thorne, Fredericton, N. B., $115,000 county asylum.

Montreal, Que.

Canadian Comstock Co., $1,500,000 addition to telephone exchange.

W. Staines, $90,000 apartment house, Atwater Ave.

Chas. Egan, $15,000 house on Mance between Bernard & St. Viateur.

W. E. Booth, 17 pair semi-detached houses, $140,000, on Hampton.

Mt. Dennis, Ont.

Patterson Electric Co., $20,000 church.

Outremont, Que.

A. M. Hayes, $20,000 hall.

Ottawa, Ont. .

J. Ellicott, $6,000 house on Lakeside Ave.; $6,500 house on Grove Ave.; $8,000 double residence on Riverdale Ave.

E. Headley, $7,000 house on Central Terrace; $6,000 hall and rooms.

Art. Davis, $8,000 double residence on Russell Ave.; 5 houses on Renfrew Ave., $5,000 each; $3,600 house on Hinton Ave.

G. Young, $5,000 house on Fairmont Ave.

J. Ladoucer, $4,500 house on Warren Ave.

Wallace Chugg, $7,000 double residence on Huron Ave.

Marchand Electric Co., $7,000 double residence on Grove Ave.; $7,000 house on Smirle Ave.; $17,000 apartments Clarence and Cobourg streets; $7,500 house on Rockwood.

H. L. Allen, $4,000 house on Lees Ave.; $7,000 house on Broadway; $9,000 house on Central Terrace.

Port Credit, Ont.

F. Robinson, 149 Coleridge St., Toronto, $6,000 house on Hiawatha Rd.

E. McNeice, $7,000 house on Wellesley St.

J. McMahon, residence on Centre Rd.

Smiths Falls, Ont.

John Fader, $45,000 stores on Russell St.

Sarnia, Ont.

Chambers Electric Co., $5,000 house on Brock St. East.

St. Raphael, Ont.

R. D. Deriger, $40,000 convent.

St. Catharines, Ont.

H. C. Holmes, $8,000 house on Centre St.

A. Hawley, alterations and addition to residence, $8,000.

Sault Ste. Marie, Ont.

O. C. Carney, $2,800 alterations and addition to hospital; $5,500 house.

J. Stearns, $4,000 fruit storage warehouse.

Three Rivers, Que.

R. Gailloux, $6,000 house; house on Coteau St. Louis.

P. Rochon, $50,000 school; R. C. School.

Toronto, Ont.

S. Johnston, $7,000 bungalow, 174 Brookside Ave.

B. Balment, 4 houses, $4,000 each, north east corner Dawes Rd. and Coleman Ave.

Taylor Bros., 3 pair houses, $6,000 pair, west side Woodfield Rd. near Applegrove Ave.; 1 pair houses $4,500 each, west side Woodfield near Queen East.

Timmins, Ont.

J. Alworth, $35,000 office building.

Vancouver, B. C.

C. H. E. Williams Co., Ltd., $550,000 apartment block, Georgia and Hornby streets.

Windsor, Ont.

John Mailleaux, $7,000 double house on Howard Ave.

Windsor Electric Shop, 3 stories on Ouelette Ave., $12,000.

Westmount, Que.

R. Chamberland, $10,000 house on Delorimier Ave. between Rachael and Marie Anne.

Selling Millinery in Off Season

(It Applies to Electrical Goods)

Somewhere the story has been told of a new salesman who got a position with a manufacturer of artificial flowers and millinery trimmings. He started work in April, and being very "green" he didn't know that late Spring and Summer were supposed to be "dead" seasons in the millinery trimming business. The line looked good to him, so he went right out and hustled. Being a hard worker, he kept on going through May, June and July. Of course, he found the latter months somewhat harder, but he blamed it on the hot weather and pegged away all the stronger. Result—he broke all records for his territory. He was surprised to learn when he returned to the home office that he had been succeeding in the off season, while all the other salesmen were just "stalling" along and blaming poor business on the time of the year.

This little story doesn't mean that there isn't any such thing as an off season because everyone knows better than that. But it does mean that frequently the off season is as much an off season for the salesman as it is for the merchandise. Naturally, it is not easy to sell at all seasons of the year; there's always some period in every line when the demand slows up. But instead of increasing his efforts in slow seasons, the dealer is prone to take it for granted that he can't sell at all, and to let up on his work.

The matter of the off season is of paramount importance in the lamp and appliance business. Many a dealer finds sales easy during certain seasons, and is discouraged when he realizes that the demand is small.

A good time to sell is when the other fellows let up on their efforts, and therefore the dealer who keeps right at it during the off season is likely to get a surprising amount of business.—Contact.

Montreal Light, Heat & Powe

In Every Case the Interiors and t



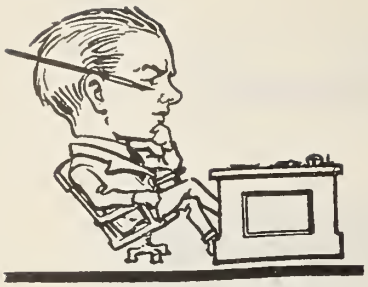
1.—2575 East St. Catherine; 2.—858 St. Denis; 3.—1657 Papineau; 4.—1975 Park; 5, 6, 7.—603 West St. Cather

Con. Maintains Good Retail Stores

Windows are Exceptionally Well Lighted



80 East St. Catherine; 9.—603 West St. Catherine; 10.—Notre Dame de Grace, 5677 West Sherbrooke



The Editor Comments

Why Germany Undersells

Germany is grappling with the eight-hour day — throttling it. The fight has seen the fall of the government and its return to power on the distinct understanding that the eight-hour day is a thing of the past. The industrialists of Germany are insistent. It's a matter of life and death, they say.

Canada will do well to consider the effect of the movement. German competition is already with us. The worthlessness of its currency enables Germany already to undersell local manufacture. What will be the effect of a ten-hour day? Can we continue on the old basis? Can Canada, working eight hours a day, paying high wages, and taking things easy at that, compete with ten hours a day, starvation wages and intense concentration?

The influence that Germany is certain to exert on the rest of the world is not pleasant to contemplate, but there is no use sticking our heads in the sand. There is only one way to meet this competition—greater efficiency. We hope it will not mean longer hours in Canada, nor reduced wages, but there is no shadow of doubt that it means harder work, more brains, better organization. The years ahead of us are certain to be strenuous ones and in such times the fittest only survive. We do not want to beat Germany with her own weapons. The competition must be won by superior organization, superior intelligence and an industry that is not of the machine type.

Neglected Advertising Opportunity

An illustration which appears elsewhere in this issue has as its sole subject a signboard which was placed in front of a building under construction. The board carries the names of the various concerns who did the work on the building, and a noteworthy feature of this listing is the inclusion of the electrical contractor's name.

Valuable opportunities of thus bringing their names before the public are too often lost by electrical contractors. At the present, we can call to mind two instances where the fronts of buildings under construction are covered with cards from the plasterers, plumbers, brick manufacturers, and so on, but there is not a single evidence of the fact that any electrical work is being installed.

This condition can scarcely be blamed to excessive modesty on the part of the contractors, and it would surely be unjust to accuse them of being ignorant of the value of advertising. The omissions appear to be due simply to the fact that the placing of a sign telling who is doing the wiring work is the job of nobody in particular. It is a detail often overlooked in the stress of more pressing matters.

Such omissions of advertising opportunity mean real losses. A reminder on the desk pad, or the placing of a sign of the kind indicated, in a prominent position in the contractor's office, are means whereby to make sure that his name is on every building that he wires.

Real Value in Trade Catalogues

Users of electrical machinery and materials often miss a great deal of valuable practical information when they fail to obtain and read the catalogs and other trade literature issued by manufacturers. There was once a day when publications of that sort were largely a collection of perverted facts and mis-statements about the equipment or commodity described. Unsubstantiated claims were freely indulged in and, in not unfrequent cases, even deliberate untruths were tolerated if, by that means, the sales argument could be intensified. The object, in other words, was to sell the goods not so much on their intrinsic merit—little of which was evident in many of the products advertised through trade literature—as on mere claims or guesses as to their serviceability or performance, many of which, if not most, were entirely incapable of substantiation. Happily, the day in which practice of that sort, was common is about over. Merchandising in all lines has taken on a new aspect in which truth in advertising plays a large part, and particularly in the merchandising of electrical machinery and materials, unproven claims of superiority have given way to established records of performance that, because of their basis in fact, carry undoubted weight with prospective customers. The broadcasting of these performance records and service data has become one of the chief functions of electrical trade literature today and because of this electrical men are being led to a greater confidence in the various lines of equipment and materials offered for their consideration.

In presenting practical information to their readers these catalogs and bulletins are performing an excellent educative function. By announcing new lines, by indicating how machines may be used or materials applied, by publishing practical experiences, and by recording cost data, trade literature has become an important element. Many concerns spend vast sums of money to produce catalogs and bulletins of attractive appearance and with contents of high order.

We are too prone to belittle the efforts of the manufacturers of electrical equipment and materials. Literally millions of dollars have been spent by them in research work in an effort to perfect their products. And they are not doing this with wholly selfish motives. They have, with but mighty few exceptions, the interest of the whole electrical industry at heart.

Just as the policies of the manufacturers have undergone improvement in this way in recent years, so has their trade literature. No longer do reputable firms produce the slashing, knocking type of catalog that was common enough only a few years ago, but rather do we see literature that is essentially practical in character and thoroughly high class in appearance. It is a good plan for electrical men to obtain and study the best of these catalogs and so acquire a vast amount of practical information that cannot but stand them in good stead.

Are We Very Far Ahead?

It is our habit to assume that we are miles ahead of anything that appertained of the time of our grandfathers.

Occasionally, however, little things crop up that disturb this complacency. Such an instance occurs in a consideration of the production of lumber—our natural assumption would be that man for man, more board feet were sawn now-a-days by modern methods, using electric drive, than ever happened before in the world's history.

That this assumption is not wholly justified is shown by an examination of the facts. A western lumberman states that his father, about three-quarters of a century ago, built a mill dam over a stream and, with the help of a millwright, constructed a very primitive plant for cutting up logs. There was an up and down saw making about fifteen strokes per minute, and practically all the equipment used was of wood, wood cogwheels all through, and just a little wrought iron. With the mill the owner averaged a cut of 1,000 feet daily, doing all the work himself.

Today one of the largest mills in Western Canada is cutting 300,000 feet daily, using electric drive, and every possible refinement of machinery. There are three hundred men employed in the plant, and we are informed that this figure of one man per thousand feet cut, is a fair figure for modern plants.

This revelation is somewhat of a shock to our complacent belief in modern superiority. It is true, however, that there are conditioning factors that do not make the contrast quite as broad as it appears. The main fact, however, is that today, there is a general manager, superintendent, foremen, mechanical experts and a host of others, connected not alone with production, but with maintenance, yard work, and so on, who bring down the average production per man so that this huge mill is really not turning out any more lumber per man than was done in the primitive days.

Are we as far ahead as we commonly think we are?

Reaching Canadian Markets

British Government Trade Commissioner F. W. Field, has just completed his annual report and in it refers, at length, to a topic we frequently hear discussed by British manufacturers' representatives in Canada—the lack of understanding of the types of service required in Canada. Mr. Field points to the keen competition already existing between Canadian and United States firms and urges the necessity of a study by British manufacturers of fundamental Canadian Conditions by a visit to this country.

If one may judge by the frequent complaints of British representatives in Canada of the poor support sometimes given by the home offices, it is little wonder that the efforts of the British manufacturer to sell in the Canadian field have often been unsuccessful. We heard the other day of equipment shipped to Canada entirely different from the specifications. The excuse was that the British specifications were better. Nothing could be more futile than such a course. Right or wrong, the specifications in many such cases are as fixed as the laws of the Medes and Persians—they represent Canadian practice. We are not saying that British practice may not be better but what this firm evidently didn't know was that the Canadian specifications must be adhered to. The equipment mentioned above, of course was not acceptable, and the order was lost.

Then one hears, almost daily, complaints of cablegrams unanswered, specific requests ignored, time limits exceeded and so on. Mr. Field deals with these items at length and very truthfully and logically. If the British manufacturer wants to do a lucrative business in Canada he must not only conform to Canadian specifications but he must live up to Canadian ideas of service. Such manufacturers will be well advised to study his report.

Application of High Frequency Telephony to Central Station Service

Method is Now Entirely Automatic and Provides for Duplex Communication—High Voltage Direct Current from Rectifier

By C. A. BODDIE
Radio Engineer, Westinghouse Electric & Manufacturing Co.

High frequency telephony has been developed not only to the point where it can be used successfully for communication over high tension power lines, but it is now entirely automatic. It offers to the central station the same kind and quality of telephone service as offered by first class commercial wire line automatic telephone systems.

Power companies have in the past had great difficulty in maintaining satisfactory communication over their private telephone lines, when carried on the same poles as the power line. Telephone lines directly exposed to the high voltage power lines are in-



High frequency transmitter and rectifier

variably noisy and must be carefully transposed and drained to be at all workable.

High frequency telephony now offers to the central station an independent means of communication. One of its principal features is its use of the main power line as the medium of communication. Owing to its great mechanical strength the power line itself affords the most dependable medium of communication.

*Paper presented before the Central Elecric Railway Association Convention, Cedar Point (Sandusky) Ohio, July 18, 20, 1923.

Fundamental Principles

High frequency telephony is a system of telephone communication using high frequency currents as a means of transmission. It differs from radio in that it is a conduction current phenomena related to a wire line rather than a displacement current in space. The writer proposes to identify the method by its most outstanding feature namely "High Frequency."

A power line may also be used for telephone communication and control while at the same time carrying its regular power load, if the high frequency method is used. It may have impressed upon its currents of different frequencies from the main transmission frequency and these superimposed frequencies may be picked off at the end of the line notwithstanding the fact that the line is already carrying thousands of kilowatts at high voltage.

These superimposed high frequency currents are transmitted by the power line in exactly the same manner as the power currents are transmitted. Statements to the effect that the power line acts as a guide rather than a conductor for high frequency currents are ambiguous and misleading. High frequency currents on wire lines obey all the laws of the transmission lines. Those equations which have been applied to long high voltage power lines and also equations derived in the study of telephone wire line transmission apply in the transmission of high frequency currents.

The superimposed high frequency currents are most easily introduced into the line by an antenna wire carried on the same poles as the power line. In the system here described, two antennas are used, one for transmitting and the other for receiving. High frequency currents generated by a 250 watt oscillator tube are led into the transmitting antenna which by electro magnetic and electro static induction induces currents of the same frequency in the transmission lines.

Frequencies Used

The lower the frequency of the superimposed currents, the more difficult it is to get them into the high voltage power line. This difficulty of coupling with the power line is largely compensated for, however, by the greater freedom with which low frequency currents are transmitted.

A further factor in selecting a desirable frequency for telephone communication is that it must be above audibility. This requires the use of at least 10,000 cycles, which is just below the upper limit of audibility. While fairly efficient in the matter of transmission a frequency of the order of 10,000 cycles presents difficulties in the way of modulation and also refuses

to lend itself to duplexing owing to the production of an audible heterodyne beat note if frequencies of this order are used. The lower frequencies of 30,000 to 60,000 cycles are best suited to long distance communication while the higher frequencies from 100,000 to 150,000 cycles are well suited to short distance communication.

Automatic Control and Selective Calling

The system as worked out provides the load dispatcher and each power station and substation operator with an automatic telephone desk set. This desk set is provided with an automatic call dial, call bell, microphone and receiver. The operation of calling is accomplished by dialing the desired number on the automatic dial exactly as is done with standard phones of wire line automatic telephones.

The apparatus for generating, modulating and receiving the high frequency currents is usually located in a small out building beyond the high tension transformers and switching equipment. The distance may vary from 1000 ft. to 5 miles or more, depending upon power station and substation layouts.

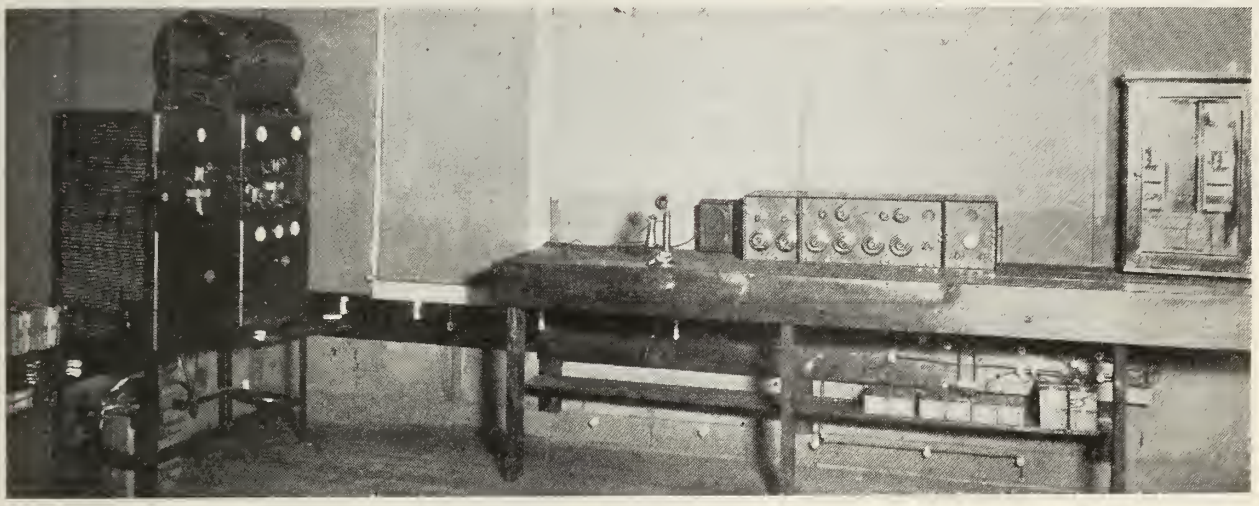
Full automatic control of the high frequency apparatus from the operator's desk set is accomplished over two wires. This involves the operation of starting the high frequency apparatus when the receiver is lifted from its hook, of calling when the call dial is operated, of simultaneously transmitting the microphonic currents from the dead set microphone to the high frequency modulating apparatus and of transmitting the incoming voice currents from the high frequency receiver to the desk set receiver, and of ringing the operator's call bell.

Duplex Communication

The system is "duplex," that is, it provides for simultaneous talking and listening just as with the usual wire line telephone. This gives the station operator the same flexibility, freedom and efficiency of communication to which he is already accustomed from the use of his wire line phone. The desirability of making the high frequency telephone the full operating equivalent of the wire line phone, was recognized at the outset of this development, since its principal application will be in central station load dispatching service.

Previous systems have made no attempt to provide for duplex communications or selective calling, and therefore, do not aim at the same standard of flexibility and efficiency afforded by a wire line telephone. They have been merely installations of long wave transmitting and receiving equipment, being content with the limited one way communication.

High frequency telephony over high tension power lines is confronted with nearly the same difficulties as direct radio. This is due to the difficulty of getting the energy into the power line and also to the relatively poor transmitting efficiency of a power line for the transmission of high frequency currents. The efficiency of a power line is somewhat better than direct radio, but is still of the same order of magnitude.



Complete installation at Jackson

Previous attempts to obtain duplex operation in direct radio with high frequency currents over power lines, have aimed at the neutralization of the current induced in the delicate radio receiver by the local transmitter at the same time preserving a high degree of sensitivity to the reception of incoming signals.

In the development of the present system of high frequency communication a very simple and efficient means of neutralization has been discovered. The circuits adopted do not waste any appreciable amount of transmitted energy. The discovery of these circuits is the central feature of the whole development for without the incorporation of single and reliable duplex the way would not have been open to the incorporation of the many desirable features possessed by the automatic telephone.

Wire Line Extension Using Two Wires

The evolution of satisfactory duplex immediately opened the possibility of combining the voice currents supplied to the high frequency transmitter and those delivered by the high frequency receiver into a single pair of wires by means of which the entire high frequency apparatus is connected to the desk telephone set. This great advance in flexibility was secured by adopting and modifying various circuits already in use in the wire line telephone art.

Sets Have 250-Watt Capacity

Experience with central station transmission systems has convincingly indicated that small powers of 5 and 10 watts are useless and that even 50 watts is too small an energy output for anything but simple and short lines. We have adopted 250 watts as a de-

sirable size of transmitter because excellent tubes of this rating are commercially available, and because this energy output will meet the majority of central station requirements. Transmission lines of great length and having numerous transformer banks will require larger sets.

Rectifier

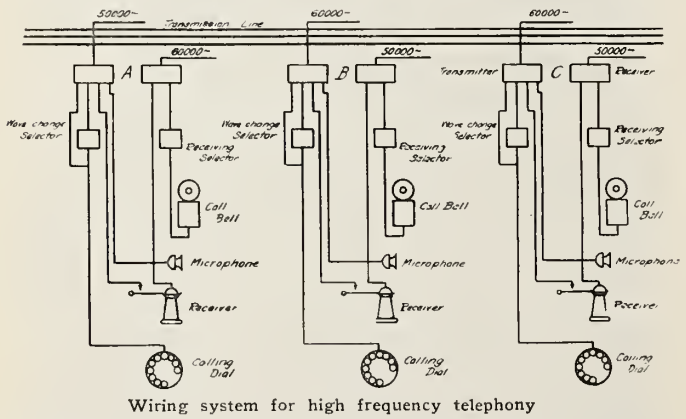
The 2000 volt direct current required by the 250 watt vacuum tubes of the transmitter is derived from a vacuum tube type high voltage rectifier instead of from a motor generator. Sixty cycle, 110 volt current is required by this rectifier. It is applied to the low tension windings of a step-up transformer which supplies high voltage 60 cycle current to the plates of two high voltage vacuum tube type rectifier tubes. Both halves of the 60 cycle alternating current are rectified and the pulsations in the resulting undirectional current are entirely smoothed out by suitable condensers and inductances, thus delivering a perfectly steady direct current of 2000 volts potential to the high frequency transmitter.

The adoption of the vacuum type rectifier eliminates the troublesome high voltage direct current generator which has heretofore been the only source of high voltage direct current.

Transmitter

Two frequencies are used in the complete operation of this system, one for transmitting and one for receiving, for example the dispatcher's transmitting frequency may be 50,000 cycles and his receiving frequency 60,000 cycles.

The 250 watt oscillator tube is connected to an inductance coil and suitable condensers arranged as an oscillating circuit. The high frequency current developed by this oscillator is lead into the transmitting antenna. A second 250 watt tube is connected to the oscillator, the pair of tubes being fed through a large iron core inductance. This inductance tends to



Wiring system for high frequency telephony

maintain a constant flow of current to the oscillator and modulator tubes. The modulator tube alternately robs and adds to the current passing through the oscillator tube and thereby serves to vary the high frequency output. This system of modulation is known as constant current or Heising Modulation. A 50 watt vacuum tube is interposed between the relatively weak microphone circuit and the grid of the 250 watt modulator tube. Its purpose is to amplify the weak voice currents produced in the microphone circuit.

Calling is accomplished by connecting the grid and plate of the speech amplifier tube in a low frequency oscillatory circuit. A relay mounted in the speech amplifier box serves to convert the talking circuit of the speech amplifier into a low frequency oscillating circuit each time the contacts of the automatic calling dial of the desk telephone stand are closed. The output of this low frequency oscillating circuit is applied to the grid of the 250 watt modulator tube. Thus, at each impulse from the automatic calling dial the transmitter emits a high frequency modulated current. This constitutes the calling system of the transmitter.

Receiver

The high frequency currents transmitted by the power lines are picked off by the receiving antenna at the distant station and lead into the tuned primary circuit of a coupled circuit type of radio receiver. The secondary circuit is provided with Armstrong regeneration which may be used if necessary. A detector and one step amplifier are provided to convert the high frequency received currents into corresponding voice currents and amplify these sufficiently to be applied to the desk set receiver. A third tube connected as a detector normally receives the output of the one step amplifier. When a modulated high frequency current is received the plate current of this detector tube is greatly reduced. A telegraph relay provided with a special high resistance winding is connected in this plate circuit. Hence, each time a modulated high frequency impulse arrives the contacts of this relay will act. These contacts are arranged to close at each impulse from the automatic call dial.

Selector

The contacts of the plate circuit relay associated with the amplifier, directly control the first relay of a selector. The selector consists of a magnet driven contact arm associated with the necessary fast and slow relays and is arranged to step forward one notch for each impulse received from the calling dial. If the contact arm pauses on the proper contact point a slow relay drops out and completes a circuit through the call bell which continues to ring until the station operator lifts his receiver from his hook. When the receiver is unhooked the call bell circuit is opened and the one step amplifier is transferred from the relay detector tube to the telephone receiver of the desk set. The act of unhooking the receiver also lights the filaments of the transmitter tubes and applies high voltage to the transmitter and is then ready to talk.

It is the introduction of a selector, which closes its contacts only after receiving the proper number of impulses which makes it possible to call any particular party on the line to the exclusion of all other parties.

Installation on Consumer Power Company

The Westinghouse Company has just completed the installation on the lines of the Consumers Power Company (U.S.) of the first fully automatic high frequency telephone system using high voltage power lines as a medium over which communication is affected. The initial installation is over the 140,000 volt sixty cycle line between the Jackson Steam Plant and the Elm Street Station at Battle Creek.

Ferguson Pailin Ltd., switch gear manufacturers 321 King St. East, Toronto, H. K. Ansingh, manager, have moved to larger space in the same building.



A window used to sell the "Customer-Shareholder" Idea

Customer Shareholder Campaign by Ottawa Light, Heat & Power

One Week's Work Sold Over 5,000 Shares—All Employees Took Part—Customers Were Pleased

The Ottawa Light Heat & Power Co. inaugurated a Customer Shareholder Campaign in September 1923, at which time every one of their forty thousand customers were invited to become partners of The Ottawa Electric Company and the Ottawa Gas Company, by participating in an issue of $1,500,000, 6½% cumulative preferred shares of the Ottawa Light Heat & Power Company. The purpose of this was to provide the increased equipment necessary to supply customers' requirements, and to redeem $1,300,000 par value bonds which were then outstanding. It was pointed out that the Ottawa Light Heat & Power Company operates The Ottawa Gas Company, which has unfailingly served the Ottawa population for sixty-nine years, and The Ottawa Electric Company, which is a pioneer Canadian Hydro-electric company, established thirty-six years ago. These two companies have always been successful because their capacity for giving service has kept pace with the growth of the city and the great demand for gas and electricity which this growth has produced.

Sixty-nine years ago the Bytown Consumers Gas Company introduced the citizens of Bytown to the wonders of illuminating coal gas. You can imagine how important an event that was for those times. Little Bytown with its sparse population became the capital of the Dominion of Canada; Bytown Consumers Gas Company became The Ottawa Gas division of the Ottawa Light Heat & Power Company, and through conscientious efforts is keeping pace with the city's growth. The company has built a plant and organization at the cost of several million dollars, and now unfailingly deliver no less than 500,000,000 cubic feet of gas each year through 145 miles of gas mains to more than 17,000 customers.

For thirty-six years to date the citizens of Ottawa and Hull have enjoyed an electric light and power service that compares favorably in efficiency and accuracy with that of other cities in Canada. This Ottawa Electric division of the Ottawa Light, Heat & Power Company has in service 1;150 miles of wire and 18 miles of conduit, reaching in every direction and covering every suburb of Ottawa. The company was a pioneer of incandescent electric light in Canada, having first introduced it in Hull and then in Ottawa in 1887. A cordial relationship has always existed between the company and its twenty-two thousand customers, which includes the Dominion Government, the Canadian Pacific Railway Company and the Canadian National Railways. The permanent policy of the company is to serve its customers so that this goodwill shall be maintained and strengthened.

The Stock Issue

The whole $1,500,000 of stock was underwritten by the Royal Securities Corporation of Montreal. It was however felt that an effort should be made to place as much as possible of this stock among the patrons of the company. For this purpose, in the latter part of August and early in September, a systematic Customer Shareholder advertising campaign was organized, and every day, matters of interest appeared in the daily papers pointing out how closely allied the companies had been with the growth of the city for many years, and inviting customers to become shareholders.

While the underwriters had placed the stock with practically every financial bond and stockselling house in the city, this company conducted a short intensive campaign through its employees. For this purpose

teams were organized in various branches of the operating and office departments. There were eight teams in all. The members of these teams, while carrying on their regular daily duties, in spare time and in evenings worked enthusiastically, with the result that 1,600 shares were sold to approximately 730 customers, this distribution being quite distinct from the large sales made by the brokers resident in this city. A fair estimate of these brokers' sales would be about 3,500 shares additional.

Three prizes were offered to the teams bringing in the largest amount of subscriptions. There also were two individual prizes for the largest amount of subscriptions brought in by an individual member of any team.

The campaign was conducted for one week. First prize was won by the Ledgers Branch, under the captaincy of Mr. F. A. Jansen; Second Prize was won by the New Business and Contracts Branch, under the captaincy of Mr. F. T. Lineger; First Individual Prize was won by Mr. J. H. O'Hara, of the New Business and Contracts Branch; Second Individual Prize was also won by Mr. J. H. O'Hara.

It was found generally that the customers were much pleased at the opportunity offered, and while many availed themselves of this opportunity, many others wrote, expressing regret at being unable to subscribe and thanking the management of the company for bringing the matter to their attention.

C. G. E. Directors Considering Selling Control of Common Stock

An offer has been received by the shareholders of the Canadian General Electric Company from the General Electric Company, Schenectady, N. Y., for the purchase of their common stock.

Mr. A. E. Dyment, president of the Canadian General Electric Company, in making the announcement, said that he and his directors were of the opinion that the offer that had been received should be accepted by the shareholders, as the arrangement was not only favorable to the company, but would ultimately prove beneficial to the country.

Send Off to J. W. Pilcher by Montreal Electric Club

The Electrical Club of Montreal held its first meeting of the season on October 10. The luncheons are held in the Queen's Hotel at 12.15 every Wednesday. These meetings are always well attended and invariably provide instructive and interesting addresses on technical and general topics. John W. Pilcher was the guest of honor at the luncheon. E. W. Sayer, M.P.P., in a reminiscent mood, very ably proposed the health of "J. W.," and the response was little short of an ovation. Mr. Paul A. McFarlane, the president of the Club, made a suggestion to the effect that Mr. Pilcher be elected an Honorary Life Member of the Club, which was most vociferously carried. Music was furnished by the Queen's Hotel Orchestra, and several vocal numbers were given by Mr. Dumbrille. Mr. Pilcher made a speech, in which he feelingly expressed his regret at leaving the friends among whom he had labored for so many years. All the members joined in wishing him "Good Luck." Mr. Pilcher is being moved by his company to the head office at Toronto, where he will occupy an important position.

First Meetings of Toronto A. I. E. E.

The first meeting of Toronto Section A. I. E. E. for the year was held on October 15, primarily to assist the Membership Committee with their campaign. Short talks were given by Messrs. Hastings, Schwenger, Henderson and Leacock.

Entertaining games were played and refreshments served while Ewart's Orchestra with the addition of vocal selections supplied the musical programme. All members and non-members were given an opportunity to meet or become better acquainted and improve the spirit of the Section.

At the second meeting of the A.I.E.E., Toronto Section, held on October 19 in the Mining Building, University of Toronto, Mr. C. E. Schwenger presided.

Mr. John Mills, Educational Director of the Western Electric Company gave a talk, illustrated with motion picture films, on the Recruiting and Training Methods in a large electrical industry. He first outlined the various departments of the Western Electric Co.,—engineering, manufacturing, installation, etc.—and explained the co-operation among these various departments. He showed how a slight reduction in cost of the manufacture of an article meant the saving of thousands of dollars a year as the quantity of production was enormous. He illustrated by motion pictures the manufacture of many parts of the telephone. He also explained at some length the method used in obtaining employees, where they came from, the study of their qualifications and the choosing of the man most suitable for the job; the method of training boys for the various deparements, the apprentice course for boys of different grades of education, how selected and how taught.

The chairman announced the next meeting November 1st as a joint meeting with all the other engineering societies in the city, when Mr. Justice Riddell would give an address on "Expert Evidence."

And Again—

"What ruined your business?"
"Advertising?"
"How?"
"I let it all be done by my competitors."

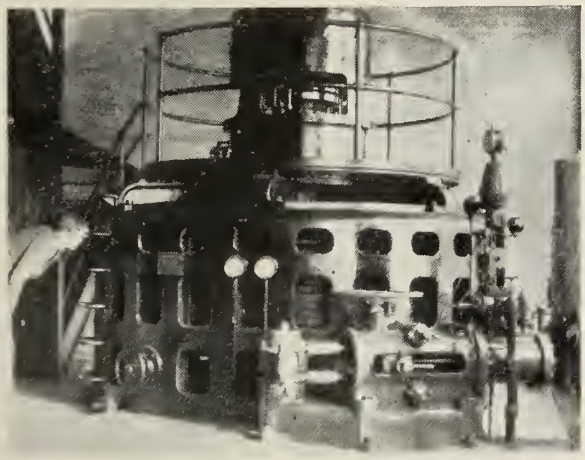
The Electric Club of Toronto held its inaugural meeting in the Yellow Room of the King Edward Hotel on October 17. The president, Mr. S. L. B. Lines, occupied the chair. The speaker of the day was Mr. Justice Riddell on the subject "Canada as an Integral Part of the British Empire." The announcement was made that the speaker on October 24 would be Major Eric Harris, and on October 31, the Hon. Dr. Cody.

Compact Power Plant on Metis River

First Photographs of Development 300 Miles Below Quebec City—Vertical Generator and Turbine Used

In the September 15 issue of Electrical News a photograph was published showing the power house of the Lower St. Lawrence Power Company at Grand Metis Falls. This was the first photograph of the development available, but our readers will recall that in an earlier issue an outline of the whole project was given.

It will be recalled that the Metis River is on the south shore of the St. Lawrence, about 300 miles below Quebec City. The water powers of this river have always presented desirable potentialities for the production of hydro-electric power and it remained for the Lower St. Lawrence Power Company, Ltd., to crystallize these possibilities. The designs for the main power development were made in the summer of May 1922, and construction was started in the



Canadian Westinghouse generator

early autumn. Since that time the project has been completed with an initial installation of 3,500 horse power.

It was found that a minimum regular flow of 300 c.f.s. could be obtained with the type of dam used, of which the centre section consists of four main waste water sluices, two overall or spillway sections one on each side of the centre section, a log pass and a short piece of plain gravity section. This except one spillway is all on the west and centre section, on the east side there is a longer stretch of gravity wall down to the intake forming one boundary of the forebay. The steel penstocks lead from the intake to the power house at the foot of the hill.

One of the photographs printed herewith shows a generator which is a direct connected unit of 3,000 kv.a. capacity. It was furnished by the Canadian Westinghouse Co., Ltd. The generator has complementary equipment of Woodward oil pressure governors, Kingsbury thrust bearings and exciter, etc. The turbine is a single runner vertical type operating under a head of 120 ft. It was manufactured and installed by the S. Morgan Smith Company.

The installation is designed to supply an area reaching about 40 miles east to Matane, and about the same distance toward the west at Rimouski. All transmission lines are carried on wooden poles and wood pin type insulators. Sub-stations are located where necessary to meet local conditions. These sub-stations are all of the outdoor type, mounted on cluster piles and equipped with necessary lightning protection. Local circuits from the sub-station are run



Where penstock comes down

within the five mile radius and consist of four wires carrying current at a potential of 4,000 volts.

This development, as a whole, is typical of the way in which the water power resources of Canada



General view

a.e being developed to meet the demand for domestic purposes and the use of small industris.

The Ward Leonard Electric Company, Mount Vernon, N. Y., are distributing on request a handsome catalogue entitled "Theatre Lighting, Past and Present."

Detailed instructions for the proper installation, operation and care of electric motors and generators are given in a booklet which has been prepared and just published by the Motor & Generator Section of the Electric Power Club, Cleveland, Ohio. These instructions are grouped under the headings: General Installation, Method of Drive, Operation, Care and Maintenance.

France Appears Promised Land for Aggressive Electrical Exporters

Conditions in France appear to indicate that there is a considerable market there for electrical appliances. Whether the Canadian manufacturer can do business there is, of course, a more difficult problem. We are indebted to Mr. F. A. Cambridge, Winnipeg, for the following items, taken from the Electrical Times:

It does seem remarkable in the Department of Haute Savoie, where engineering work of great merit has been carried out for water-power utilization and mountain railways, work which demands a high factor of safety, too, that the electrical work in the houses should be so poor and amateurish. Another thing equally remarkable in an artistic country, such as France, is the hideous selection of electric light fittings and shades, the untidy manner of using them, and, in this district at any rate, no appreciation of the most elementary principles of illuminating engineering. The shades on the pendants and most of the ordinary fittings are either shallow opal, or hardly cover more than the lamp-holder, leaving the whole of the filament exposed.

The drawing-room in the hotel from which I am now writing, for instance, measures about 20 ft. square and is lighted by six 100-watt gas-filled lamps with plain bulbs and filaments, fully exposed and only about 7 ft. from the ground. In this particular room the wiring to these lamps is concealed, but in most houses where ceiling fittings are used with surface wiring the ceiling plate of the fitting is an inch or two below the ceiling Additional kilowatt-hours consumption will not cost the supply station a French centime so long as they do not involve an increase in the peak load. Gas is not used. Wood firing for household purposes is cheap, but coal and coke are dear.

Two or three electric water heaters in a hotel of moderate size would pay their cost in a month, and the current would mostly be required in the day-time, or after the peak load. There should also be enormous applications for electric cookers, as, during the summer season, every meal is completely cooked before the incidence of the lighting peak. Electric light is extending to the smallest houses in the smallest villages, and it can only be a matter of time and initiative for electric heating to be widely adopted. Let me advise makers of electric heating apparatus to brush up their French, study freight rates, customs duty and French trading conditions, buy a few thousand francs, and come along here to see if they can do business. Even if they are unsuccessful they will have an excellent cheap holiday, and will be able to drink as much sparkling Asti as they like at about half-a-crown a bottle.

Debt Free Hydro Systems

It is a questionable compliment to speak of a municipality as having no debt. The statistics show some such curiosities, but on investigation it is usually found that their freedom from debt is largely due to the same reason that the Indians who possessed this fair land had no debt, because they have but few of the modern conveniences such as good roads, permanent bridges, drainage, modern schools and public buildings and rural telephones which more progressive municipalities consider essential. It all depends on our outlook on life and the earnestness with which we carry on the great commission given to our forefathers to possess and conquer the earth.

With this thought in view it is refreshing to find on page 295 of the 1922 annual report a list of eighteen Hydro municipalities in which the quick assets belonging to the Hydro utility such as cash, securities, book accounts and stores exceed in the value the total liabilities including debenture debt. In other words, if these municipalities could call in their unmatured debentures issued on account of Hydro, they have sufficient available assets to pay off the debt, and still have a balance of working capital which in one case amounts to nearly $40,000.00.

These municipalities are listed below, with the excess of their assets over all liabilities:

Acton	$ 165.31
Baden	1,782.01
Barrie	39,316.93
Beachville	6,195.49
Bothwell	1,422.34
Collingwood	14,959.80
Creemore	3,778.42
Elmvale	142.92
Georgetown	5,555.44
New Toronto	1,840.36
Norwich	1,964.00
Ridgetown	5,902.46
Rockwood	46.30
St. George	1,880.05
Tavistock	6,545.25
Waterdown	2,120.11
Waterford	3,574.24
Zurich	21.13

A more remarkable state of affairs is difficult to imagine and as the report lists thirty-two additional municipalities where the net balance of debt over quick assets is nominal, in one case but $19.89, there is no question but that the year 1923 now rapidly drawing to a close will see a large addition to the eighteen municipalities now making up the "honor roll."—Hydro Bulletin.

Ten Little Linemen



Ten little linemen, starting for the line,
One fell off the line truck, then there were nine.



Nine little linemen, raising up a weight,
One let go the hoisting rope, then there were eight.



Eight little linemen, climbing up to heaven,
One dropped his hand-axe, then there were seven.



Seven little linemen "putting up the sticks,"
One let go his pike-pole, then there were six.



Six little linemen, forgot "she was 'live,"
One stood on the messenger, then there were five.



Five little linemen, on the ground once more,
One upset the solder pot, then there were four.



Four little linemen, trimming a tree,
One trimmed the "high line," then there were three.



Three little linemen, hustling to get through,
One forgot his safety belt, then there were two.



Two little linemen, job is almost done,
Tapped in on the wrong line, then there was one.



One little lineman, the last of the bunch,
Swears he'll always play it safe—IT PAYS—

Stick to His Hunch

N. SLATER CO., Limited.

Hamilton, Canada

Novel advertising by N. Slater Co.



Section of 250,000 C.M. 3-condr. 13200 v. cable
manufactured by us to the specifications of
TORONTO HYDRO ELECTRIC SYSTEM
to whom we have supplied a total length of
cable to the same specifications of
369,270 Feet = 70 Miles

Eugene F. Phillips Electrical Works, Limited

Established 1889

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Copper Rods—Round or Flat — Bare Copper Wires & Cables
Trolley Wire—Copper or Cadmium—Copper
Magnet Wire — Enamelled Wire
Rubber Insulated Wires and Cables — Weatherproof Wires and Cables
Flexible Cords
Paper Insulated Power Cables
Telephone Cables

Executive Offices - - - MONTREAL
Factories - - - - - - - MONTREAL & BROCKVILLE

Electric Service League Activities

The Christmas Campaign sub-committee of the Electric Service League, Toronto, has decided to take thirty billboards for Christmas poster advertising.

The British Columbia Electric Railway company has installed the first section of a 20-foot penstock at Stave Falls, believed to be the second largest in Canada and possibly in the world, as the first step towards a new 18,000 kilowatt unit which will be in operation by October 1924.

POSITION VACANT

Electrical designer wanted, thoroughly experienced on high voltage water power stations. State experience and references to Box 408, Electrical News, Toronto. 21-22

AGENCIES WANTED

Manufacturers' Agents in Winnipeg desire one or two more good lines for wholesale trade. Box 372, Electrical News, Toronto. 18-23

POSITION OPEN

WANTED—Young Electrical Engineer, Technical graduate, with experience in electrical drafting and electrical layout for power stations. Apply to Southern Canada Power Company, Coristine Bldg., Montreal, Que., stating qualifications, experience and salary expected. 21

SALESMEN WANTED

Salesmen calling on hardware and electrical trade to handle electric household articles as side line or on commission. Advise present connections, territory and how often covered.

Also representatives for Western and Eastern Canada for johhing trade. Canadian Heater Co., Hamilton, Ontario. 21

FOR SALE

4—833 KVA—General Electric Transformers, Single Phase, 60 cycle, 22000/2300 Type WC—Form V D D in A No. 1 condition. Price very reasonable. Arthur S. Partridge, 415 Pine St., St. Louis, Mo. 20-21

FOR SALE

1—Fairbanks-Morse Duplex Piston Pump, 100 U. S. gals. per minute capacity. Suitable to pump to 125 lbs. pressure, driven by 1—10 H. P., 550 volt—3 Phase Motor. Mounted on same bed plate and connected by gear to pump. 1—Westinghouse Automatic Starter (Pressure Controlled) for same. Elmira Public Utilities Commission, Elmira, Ont. 20-24-1

FOR SALE

10,000 (series) Christmas Lamps, colored flowers and animals; 2,500 Sets miniature Pear Shape Lamps assorted colors (8 in series, 112 volts) wired with sockets and cords complete; 10,000 Miners' Lamp Bulbs 2.6V. Very special price and terms to clear. Direct Supply Association, Ltd., Victoria, B. C. 17-22

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are best found by reading the Constructional Activity pages of the CONTRACT RECORD AND ENGINEERING REVIEW each week. Advance information on hundreds of buildings, homes, factories, etc., in every issue gives you an opportunity of writing or calling upon men who you know to be in the market for wiring and electrical devices. Subscribe today. Only $3.00 per year. Contract Record, 349 Adelaide St. West, Toronto. 13T.f.

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2 British-make Diesel Oil Engines—one 465 Brake H.P. and one 184 Brake H.P., fine condition. Also Railway Generators, 275 and 125 K.W.

Moose Jaw Electric Railway Company, Moose Jaw, Sask., or Ottawa. 20-23

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3 Phase—25 Cycle—440 Volts—655 Amps—750 R. P. M., complete with D.C. Exciter, Starting and Running Panel, in first class condition. Price reasonable. Use this machine to float on your line, correcting your power factor; it will soon pay for itself.
Arthur S. Partridge, 415 Pine St., St. Louis, Mo. 20-21

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All forms of Mica Insulation.
Cut to size—Selected to Pattern—Segments.
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KENT BROTHERS

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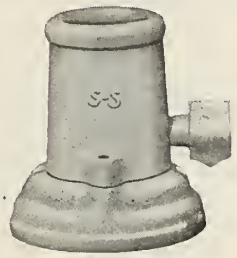
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Does not ravel badly.

Dielectric strength 1000 volts.

Weight of Tape and Carton 8 ounces.

Can be stored for a year without deterioration.

Gauge .017" to .019".

Free from Pin Holes

Seventy five feet per roll.

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The James Moncur Electric Co.
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Made in Canada

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Maximum Durability and Reliability.

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No Limit to Loads or Speeds.

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Our new Polychrome fixtures, finished in Morocco and Old Silver, are of unique design and prepossessing appearance—covering a wide range. They are finished in pleasing tones characteristic of true Morocco, with delicate blending of Silver which produces a fixture of taste and inexpressible beauty. The designs illustrated are finished in Morocco and Old Silver only, and supplied in the same number of lights.



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Spread .....7 inches

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Limited
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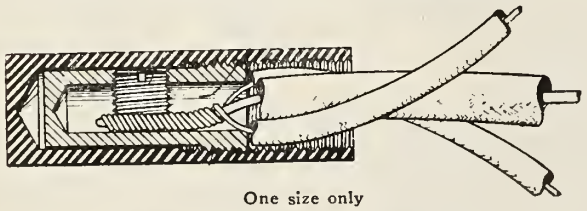
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Using Marr Connectors Better Work You Know
No Paste or Solder Tape or Torch
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Notice The Lighting Equipment Everywhere You Go

Use the Marr Connector on fixtures everywhere then notice the lighting equipment (It will stand a stare.)

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Once Used Sure Repeater.

Use the Marr Connector everywhere you go.

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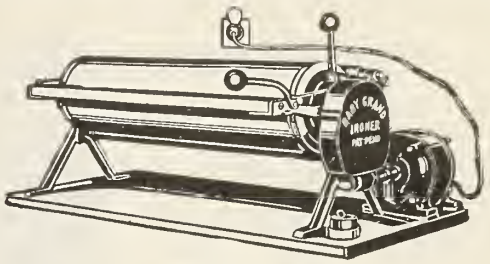
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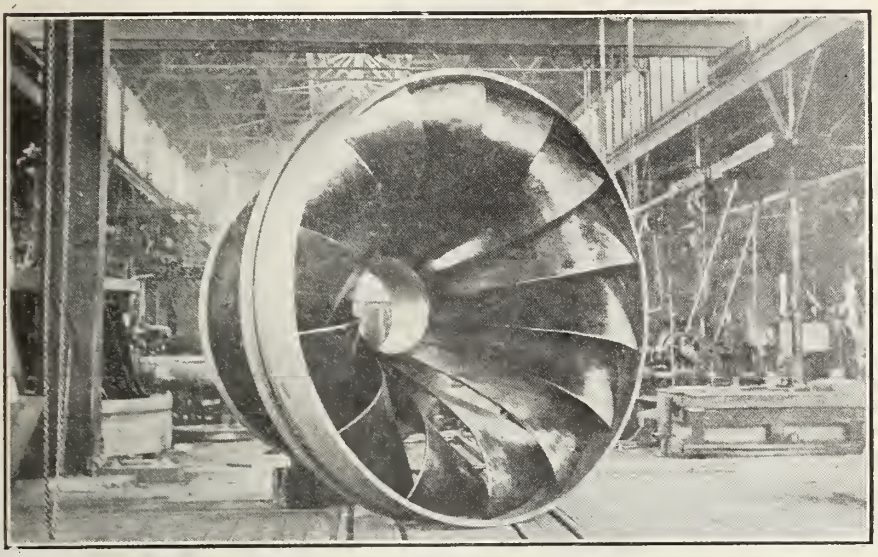
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"Direct-Acting Steam Pumps" by Frank F. Nickel. Published in 1915 by McGraw-Hill Book Company. 258 pages illustrated. Price $2.00.

"Electric Railway" by A Morris Buck, M.E. Published in 1915 by McGraw-Hill Book Company, Inc. 390 pages, illustrated. Price $2.50.

"Elements of Radio Communication," by Ellery W. Stone. A book for the Engineer, Amateur, Student and Layman. 318 pages with 145 illustrations—39 plates. Second edition published March 1923, by D. Van Nostrand Company. Price $2.50.

"Engineering Electricity" by Ralph G. Hudson, S.B., 190 pages Illustrated. Published in 1920 by the John Wiley & Sons, Incorporated. Price $2.00.

"Handbook of Machine Shop Electricity" by C. E. Clewell. Published in 1916 by McGraw-Hill Book Company. 461 pages, illustrated. Price $2.50.

"Principles of Alternating Current Machinery" by Ralph R. Lawrence. Published in 1916 by McGraw-Hill Book Company. 614 pages, illustrated. Price $3.50.

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"Telegraph Practice, a Study of Comparative Method" by John Lee, M.A. Pubished in 1917 by Longmans-Greene & Co. 102 pages. Price 75c.

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"Theory and Calculation of Transient Electric Phenomena and Oscillations," by Charles Proteus Steinmetz. Third edition, revised and enlarged. Published in 1920 by McGraw-Hill Book Co., Incorporated. 696 pages, illustrated. Price $6.00.

"Testing of Electrical Machinery," for non-electrical students, by J. H. Morecroft. Fourth edition, revised and enlarged. Published by D. Van Nostrand Company, 1921. 220 pages, 111 illustrations. Price $3.00.

"The Dynamo" (2 volume), by Hawkins & Wallis. Published in 1909 by Whittaker & Company. Price $3.00.

"The Essentials of Transformer Practice". A treatment of the theory, design and operation of the transformer from a practical engineering viewpoint, prepared primarily for the engineering student and the designing and operating engineer, by Emerson G. Reed. Just published by D. Van Nostrand Company, 265 pages, illustrated. Price $3.00.

"The Practical Railway Spiral" by L. C. Jordan, C.E. Published in 1913 by Van Nostrand Company. 155 pages. Price 50c.

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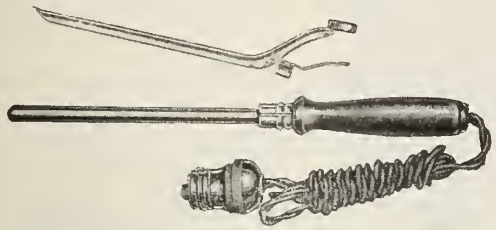
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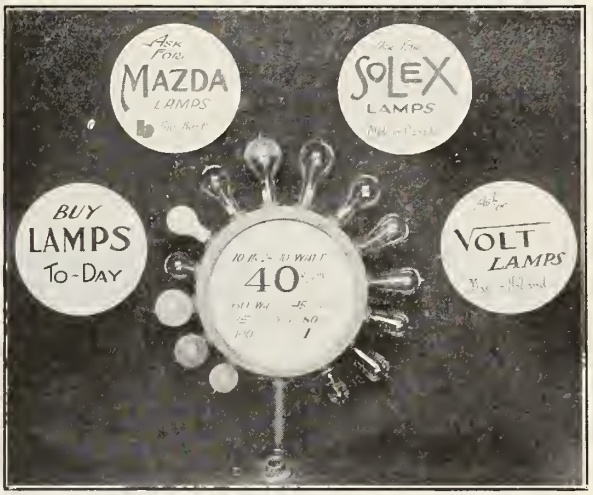


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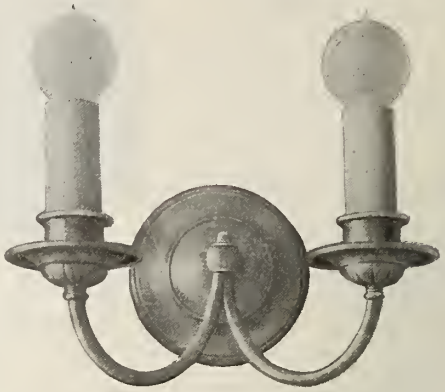
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Jobbers of Standard Electrical Merchandise

"Notice the Lighting Equipment"



Tallman Lighting Fixtures

Tallman Fixtures are more and more being recognized as a Quality Line. Fixtures that are well made from heavy weight metal, with lasting finishes. That you don't need to apologize for when offering your customer.

Not cheap, but economical.

MADE IN CANADA BY

TALLMAN BRASS & METAL Limited
Hamilton, Canada

The **DUQUESNE**
Kitchen Luminaire

Lights the Workshop of the Home

Never before has attention been so centered on the lighting of a single room. Never before has there been a unit so perfectly adapted to the lighting of this room. It is a rich opportunity to make quick sales, big sales—and a long steady profit.



Get a sample "Duquesne" and complete sales plan.

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CORAOPOLIS, PA.
R. E. DAVIS, Canadian Representative
113 Wortley Road, LONDON, ONT.

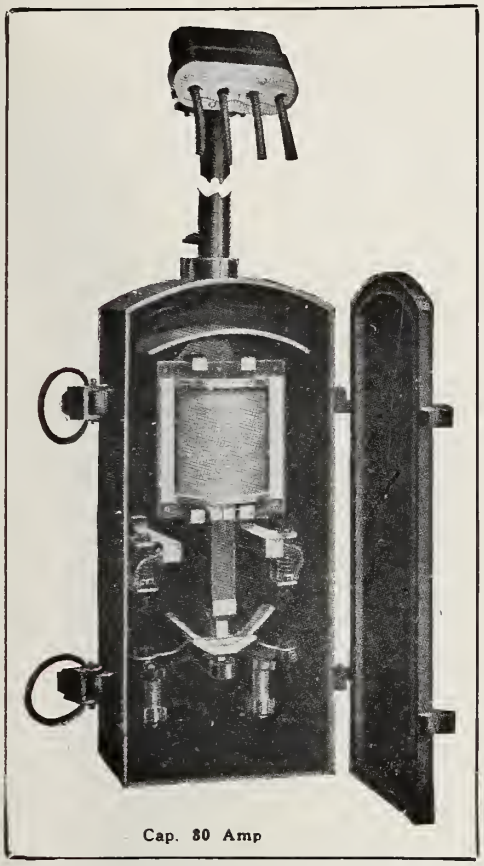
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TRADE MARK
OWEN SOUND

Gears,

Pulleys, Transmission Machinery in all sizes.

The Wm. Kennedy & Sons LIMITED
OWEN SOUND · Ontario

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M. B. SAUNDERS, 8 Silver St.,	H. C. KENNEDY 232 St. James St.,	C. A. FOWLER Tramway Bldg.,



Cap. 80 Amp

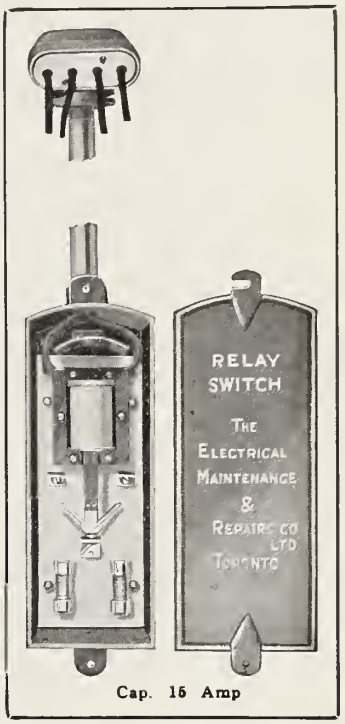
Engineers, Take Notice!

A new, smaller, simplified Remote Control Switch.

A young friend of our 30 Amp Switch—to do the many small jobs where the big fellow is too expensive.

Cheaper, yet perfectly dependable. Has been tested equal to five years' service.

For Street Lighting Control. Write about this.
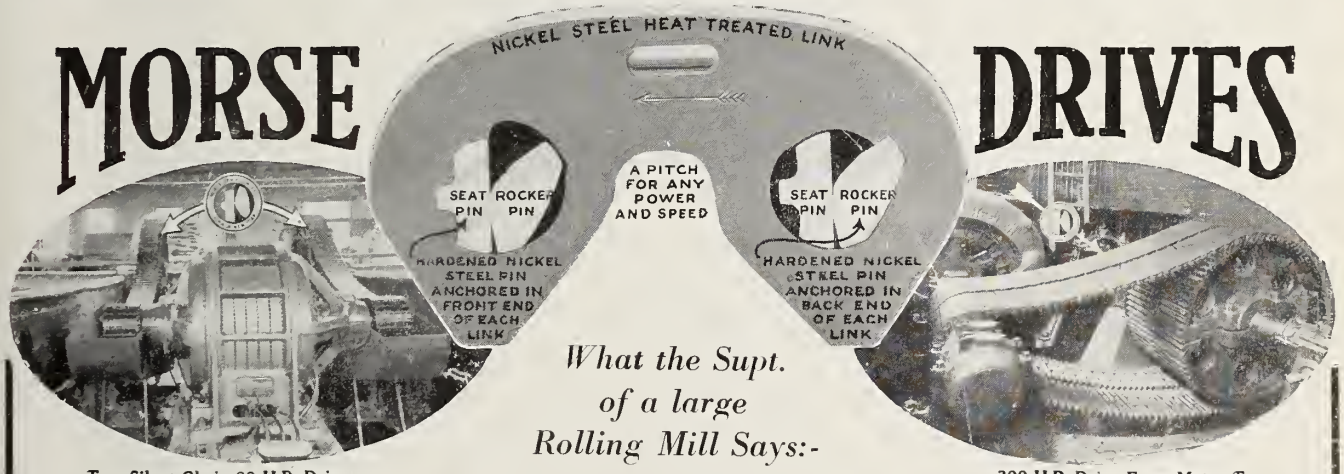


Cap. 15 Amp

The Electrical Maintenance & Repairs Company, Limited

162 Adelaide Street West **Toronto**

MORSE DRIVES



Two Silent Chain 80 H.P. Drives

300 H.P. Drive From Motor To Beater Line Shaft

What the Supt. of a large Rolling Mill Says:-

"When we erected our rolling mill in 1914 the question of what we should use for driving the mills came up and it was either chain drives or gears. Our decision rested with Morse Silent Chain Drives because first, of their reputation, second, because they were more economical than gears, third, because there was less chance of breakage with Morse Chains. Two 600 H. P. Morse Chain Drives are driving our rolling mills and practically all our motors about the Plant are also now equipped with Morse Chains.

"Our first which was one of the 600 H. P. was purchased eight years ago and today it hasn't cost us anything for repairs—and has given us absolutely no trouble. This is merely typical of our experience with this equipment. Our Morse Drives have had unusually hard usage for easily 50 per cent. of the time they have been in operation practically 24 hours out of each day on work that is a severe test because the load is not constant."

Canadian Agents

JONES & GLASSCO, REG'D.

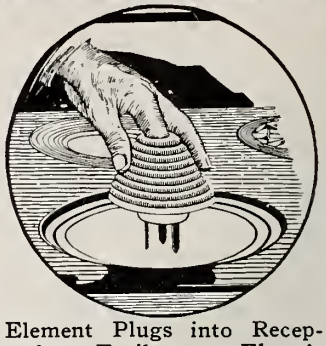
Bank of Hamilton Bldg., Toronto **St. Nicholas Bldg., Montreal**

Comparisons
boost our sales

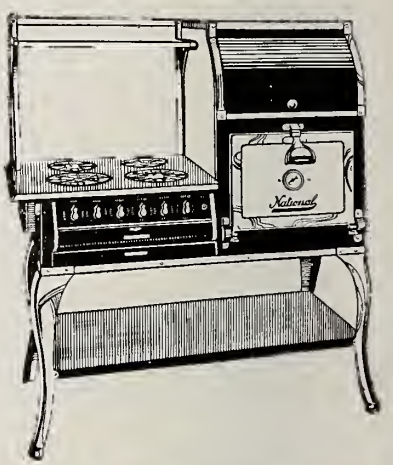
A lady in Toronto went from one place to another carefully examining and comparing Electric ranges. Then she returned to the National Electric dealer. "Yours is the range I want to buy" was her verdict.

For one thing she couldn't get away from the obvious superiority of the New National Electric burner that concentrates the heat, and is so wonderfully easy to keep clean.

This experience is nothing new—it is just typical of National Electric dealers' success everywhere. Sell the National Electric, and you'll get the business!



Element Plugs into Receptacle as Easily as an Electric Lamp into its Socket



National ELECTRIC

The National Electric Heating Co. Limited,
Toronto, Montreal, Winnipeg, Vancouver,
Makers of National Electric Ranges, Electric Heaters, Irons, Hot plates, etc.

RANGE

128 *Pages Illustrated*
(The new G & W Catalog)

EXECUTIVES—Economies of construction and operation proven out by years of world wide application are possible through the use of G & W Distribution Specialties. Catalog No. 12 (Ready Nov. 1st) shows typical applications. Study them for more profit.

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G & W Catalog No. 12 will be mailed to our full mailing list about November 1st. We are anxious to have a copy available to everyone interested in distribution engineering. If you are not sure you are on our mailing list or if you want extra copies for the drafting room, construction foremen, etc., write today to be sure to receive a copy.

G & W ELECTRIC SPECIALTY CO.
CHICAGO - ILLINOIS

Representatives in all Principal Cities

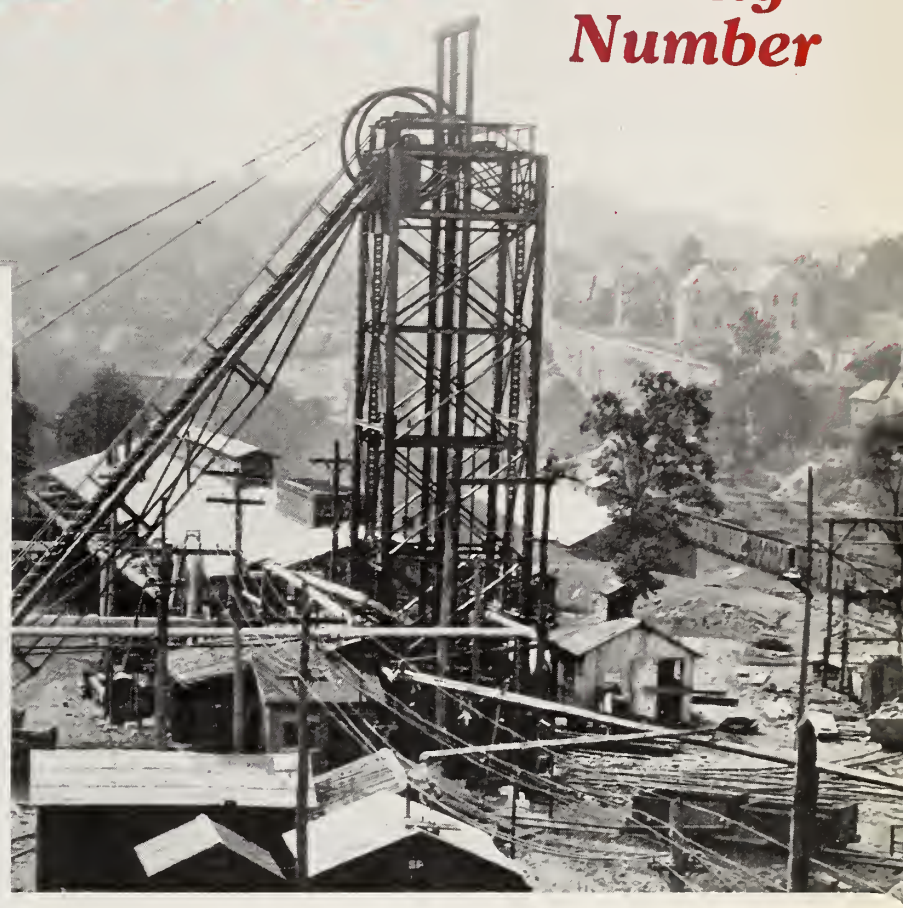
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Bentz-Richardson Co. Ltd., 592 Notre Dame Avenue, Winnipeg
Powerlite Devices Limited, New Birks Bldg., Montreal
General Supplies, Limited, Calgary and Edmonton

XXXII No. 22 Toronto November 15, 1923

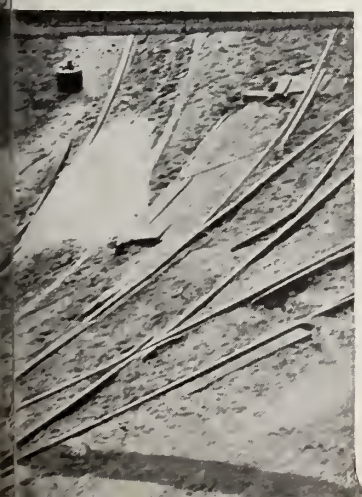
Electrical News

Mining Number





MOLONEY TRANSFORMERS



Moloney Transformers combine liberal design, great insulation strength, high efficiency and rigid mechanical construction.

Purchasing Moloney Transformers is a long-time investment in good service.

Write to nearest office or agent for latest catalogue

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and
Many Others

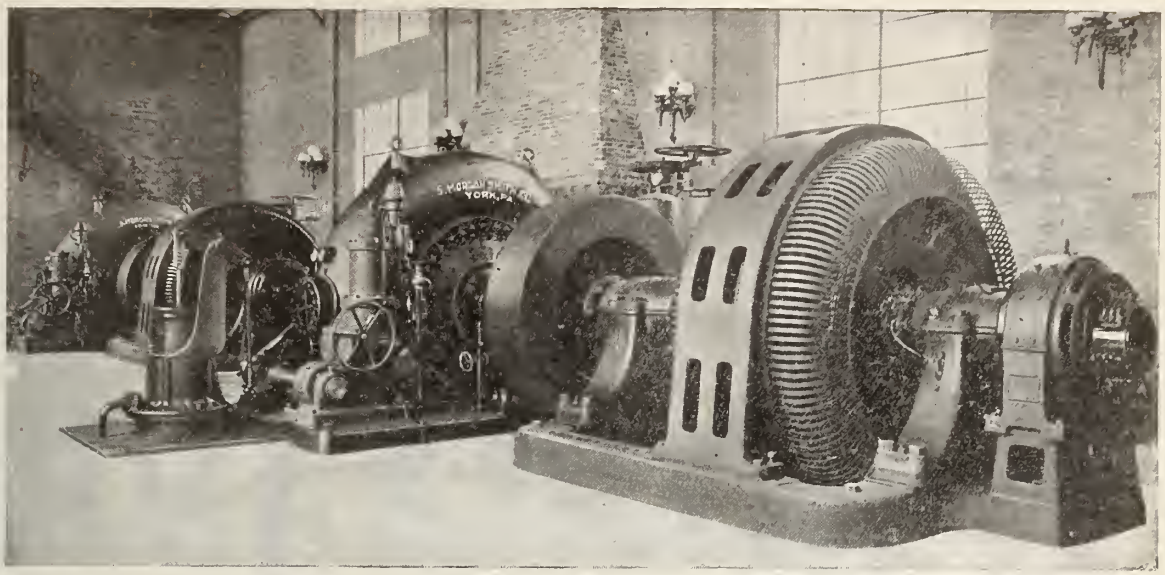
Northern Electric Company
LIMITED

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"Makers of the Nation's Telephones"

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Automatic Telephones
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Fire Alarm Systems
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Two 6575 H. P., 600 R P.M.

Smith Hydraulic Turbines

installed under 400 ft. head in the McClure Plant of the Cleveland Cliffs Iron Co. at Ishpeming, Michigan.

Each turbine drives a direct connected generator, and is fitted with bronze runner and cast steel regulating gates mounted in cast iron spiral flume. Cast steel fly-wheels, pressure regulators, oil pressure governors and Gibbs thrust bearings comprise the accessories with which these units are equipped.

Accompanying illustrations show interior and exterior views of the plant and part of the 15,400 feet of 7 ft. wood stave pipeline.

Smith Turbines are also often used to drive either direct connected or belted pumps for mining purposes.

Write Dept. "N" for Bulletin of Designs.

S. MORGAN SMITH CO., York, Pa.

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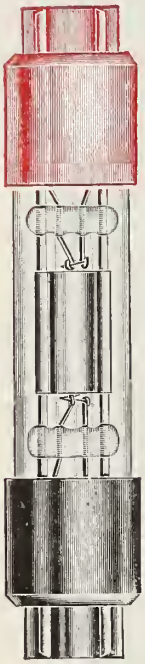
H. B. Van Every, Representative, 405 Power Bldg., MONTREAL



The Tube's the Thing!

Good Radio Reception Depends Upon

Myers Tubes



Full Size

Myers Tubes are not a make-shift. They are designed solely to meet the requirements of radio equipment. No other tube does it so well. All elements of the Myers Tube do their work properly and do not interfere with each other.

Myers Tubes are designed to bring the leads from the grid and the plate out of opposite ends, instead of in a bunch at one end, thus eliminating the large electrical capacity effect so harmful to the proper operation of a Tube.

$5.

Myers Tubes are made in Canada and are acknowledged the best by Radio experts and amateurs in every country in the world.

Made under Canadian Patents No. 229,182, Patent No. 229,183, Patent No. 229,184 and many other patents issuing and pending.

MYERS DRY BATTERY TUBE
2½ VOLT–¼ AMPERE
FOR OPERATION ON
2 DRY CELLS

Either Type
FIVE DOLLARS
COMPLETE WITH MOUNTING CLIPS READY TO BE MOUNTED ON YOUR SET. NO ADDITIONAL SOCKETS OR EQUIPMENT NECESSARY

MYERS UNIVERSAL TUBE
FOR OPERATION ON EITHER
3 DRY CELLS OR STORAGE BATTERY

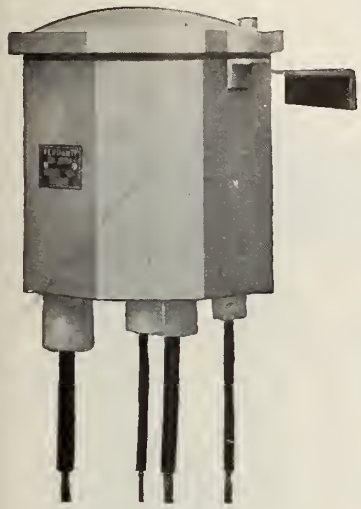
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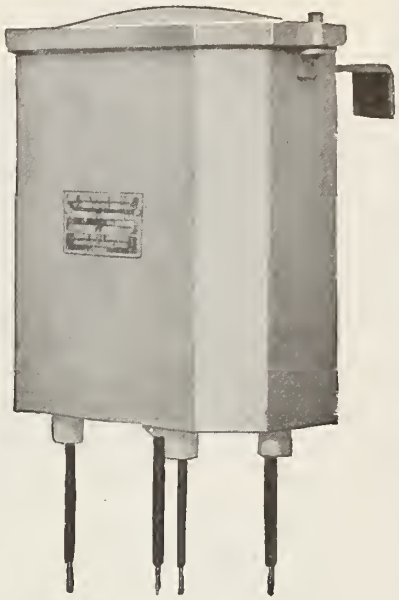
Type "GW"

Transformers

Current and Potential for Rural Distribution

TYPE "GW" Cross-Arm Mounting Weatherproof. Circuit up to 6600 volts. Rating 50 Volt Amperes.

TYPE "PW" Potential Transformer, Pole Mounting Weatherproof, Single, or Three Phase for circuits up to 6600 Volts.



Type "PW"

FERRANTI METER & TRANSFORMER MFG. CO. LIMITED

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Thomson Electric Motors

in use in many of the largest manufacturing plants in Canada

are built by

FRED THOMSON CO., LIMITED

ELECTRICAL ENGINEERS

7-13 ST. GENEVIEVE STREET MONTREAL



You Don't Estimate When You Take Your Inventory

HOW accurate would an inventory be if you counted the items in stock and **estimated** their value. A banker would consider the **whole** inventory an estimate.

On the same basis how accurate are the bills which you render—if you carefully measure watt hours and **estimate** or neglect demand?

Your bills should be based upon your true cost of furnishing current. Of this cost, 85% is due to your fixed charges—if a hydro plant. And, these fixed charges depend absolutely upon your customers' demand.

Demand, therefore, must be measured just as accurately as watt hours if your invoices are to be exact. A Lincoln Maximum Demand Meter should be installed along side of the watt hour meter on each of your customers' lines.

Hand now on left varies with load and shows this load at any time of day.

Hand now on right moves only to right and indicates maximum load since last resetting.



Write for the section (or sections) of the Lincoln Meter catalogue which interests you. SECTION I is a non-technical treatise on why demand should be measured; SECTION II, the technical treatise on demand measurement; SECTION III, Installation; SECTION IV, the Lincoln Graphic Demand Meter; SECTION V, the Lincoln method of Volt-Ampere Demand Measurement (Power Factor recognition); and SECTION VI, the Lincoln Split Core Transformer and Demand Ammeter.

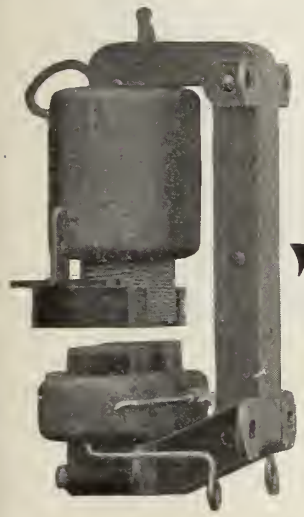
The Lincoln Meter Co., Limited
72-74 Stafford Street, Toronto, Canada
Cable "Meters" Toronto. Phone Adelaide 3969

The Lincoln Demand Meter is available with the Sangamo energy Meter—sold as the **Lincoln-Sangamo** DEMAND ENERGY **meter**

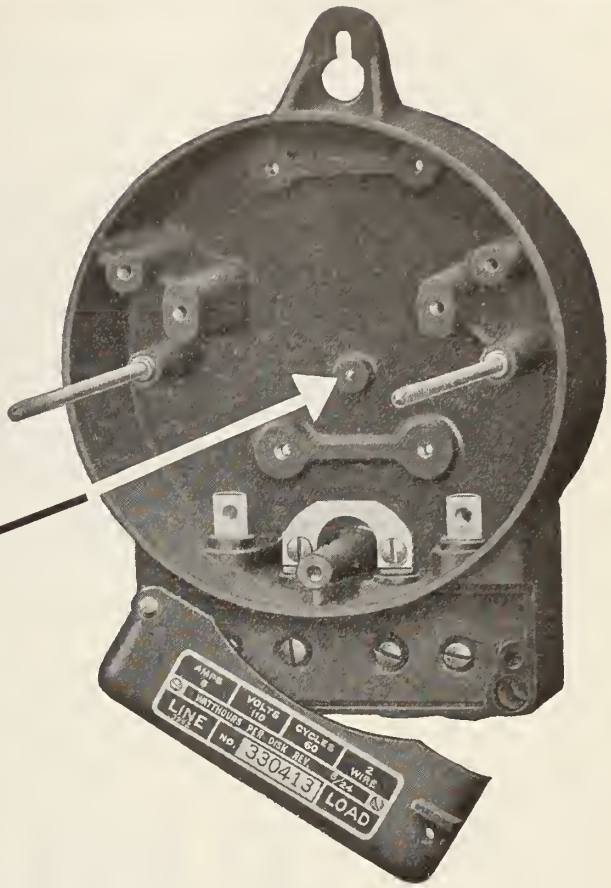
Lincoln MAXIMUM DEMAND meter

SANGAMO

Meter Simplicity



Dowel Pin Fits Here



In designing the Sangamo Type "H" A. C. Watthour Meter, Sangamo Engineers took into account the fact that all central stations do not have the services of an expert meter man, and as a result the mechanical structure of type "H" is such that any one of ordinary experience can take it apart, make replacements and assemble it again.

In fact there is only one way to assemble Type "H" meters—the right way.

For instance, the various parts of the shunt and series magnets are accurately aligned by means of dowel pins. The shunt magnet as a unit is accurately located on the meter base by dowel pins. The meter train fits on the main grid only one way—the right way. And the slot in the wormwheel bracket, engaging the upper bearing screw stud, insures proper depthing of the wormwheel in the worm.

To replace the moving element it is only necessary to remove the upper and lower bearing screws, insert the element and drive home the bearing screws firmly into the grid. This is done without having disturbed the meter adjustment in any way.

These features all insure the interchangeability of meter parts. Any part from a Sangamo Type "H" meter of similar voltage and frequency may be placed in any other without seriously affecting the calibration.

The Sangamo Type "H" is the meter for your lines. Its many other desirable features will interest you. Write today for Bulletin 5518 fully describing Type "H" Alternating Current Watthour Meter.

The Sangamo Energy Meter is available with the Lincoln Demand Meter sold as the **Lincoln-Sangamo meter**

Sangamo Electric Company of Canada, Limited

2059

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FOR POWER, LIGHT AND TELEPHONE WORK

Incandescent Lamp Cord, Flexible Switchboard Cables, Special Cords and Cables for all kinds of Electrical Work.

Prompt Shipments from Canadian Factory.

BOSTON INSULATED WIRE & CABLE CO., Limited

Canadian Office and Factory, HAMILTON, ONT.



A Galvaduct Building

Collegiate and Vocational School for Kitchener and Waterloo, Ont.

Architects, S. B. Coon & Son, Toronto. Electrical Contractor, Harris & Marson, Toronto.

"GALVADUCT"

"Galvaduct"

The most perfect interior construction conduit on the market.

Recognized as the standard of high quality.

Always specify Galvaduct or Loricated.

Conduits Company Limited

Head Offices and Factory

Toronto

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"Loricated"

A high-class interior construction conduit of the enamelled type, proof against acid or other corrosive agents.

If your jobber cannot supply you—write us.

"LORICATED"

L. & N.

COMPANY, LIMITED, ST. JOHNS, QUE.

METALLIC AND NON-METALLIC FLEXIBLE CONDUIT, AND ARMORED CONDUCTORS

ALSO

FIBRE TWINES and CORDAGE

C N C

Avoid Preventable Losses Use the Right Brushes

There is a correct type of brush for every motor and generator. Correct brushes reduce commutator wear and losses due to "tie-up."

Let us help you choose the right brushes. By years of experience in making brushes, we have learned just which type of Columbia Pyramid Brush is best for each use.

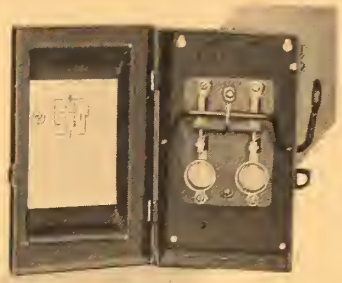
Whether your brush equipped units number one or a thousand this service is at your command. Avail yourself of it.

CANADIAN NATIONAL CARBON CO.
Limited

MONTREAL TORONTO WINNIPEG

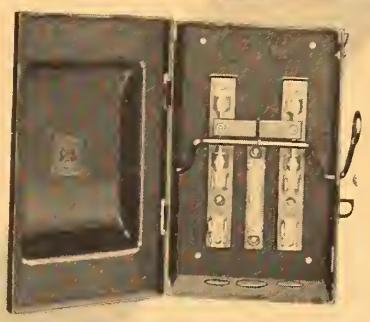
MG8

C.G.E. Service Boxes



Cat No.
C.G.E. 100

The new line of C.G.E. Steel Service Boxes consists of 30 Amp. 125 Volt, House Service type, Cat. No. C.G.E. 100A, made in three capacities, 30, 60, 100 Amp. 125/250 Volt, triple pole, Solid Neutral Boxes—externally operated.



Cat No.
C.G.E. 3030

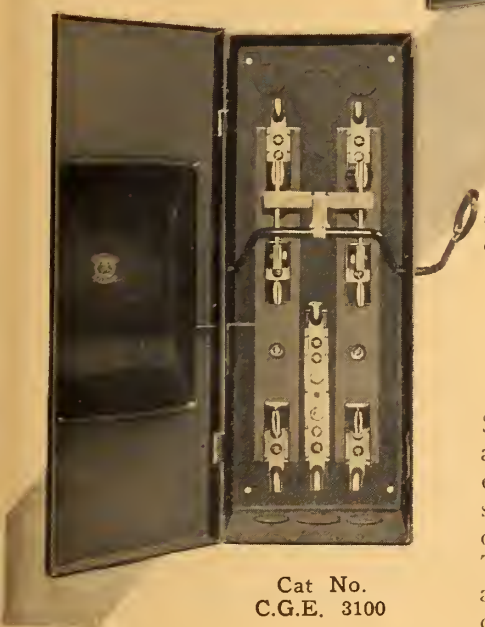
To Create Prestige

Use C.G.E. Wiring Devices throughout. No better guarantee of a satisfactory job can be given, than to state that C.G.E. material has been used exclusively.



Cat No.
C.G.E. 3060

Cat. No. C.G.E. 100A is a double pole box, switch fused with 125 volt Plug Fuses at the hinge-end, mounted on a Porcelain base. The externally operated handle is so arranged that by use of a small commercial padlock or sealing wire, the box may be locked closed, with the switch operative for Supply Companies Active Service; or the box may be locked closed with the switch locked open for Discontinuance of Service. With the box open the switch may be locked open for Wireman's protection when working on the circuit. The steel box is entirely die made, and consequently has a neat and pleasing appearance. It is completely equipped with grounding terminal, suitably placed ½" and ¾" knockouts, and wiring diagram showing proper and approved method of installation.



Cat No.
C.G.E. 3100

Externally Operated

Cat. Nos. C.G.E. 3030, 3060, and 3100, 30A, 60A, 100A. T. P. 125/250 V. Service Boxes are designed with separate units for each pole of the switch, and the metal parts are made removable for replacement of burned clips, etc. The centre or neutral poles are equipped with terminal lugs for a solid neutral connection with removable plate for meter testing. Knockouts are suitably placed, and ample wiring space allowed within the boxes. The Switches can be locked open with the boxes closed by means of stops and latches for padlocks. These three service switches can be readily converted into double pole 250 volt devices if desired.

"Made in Canada"

Canadian General Electric Co., Limited

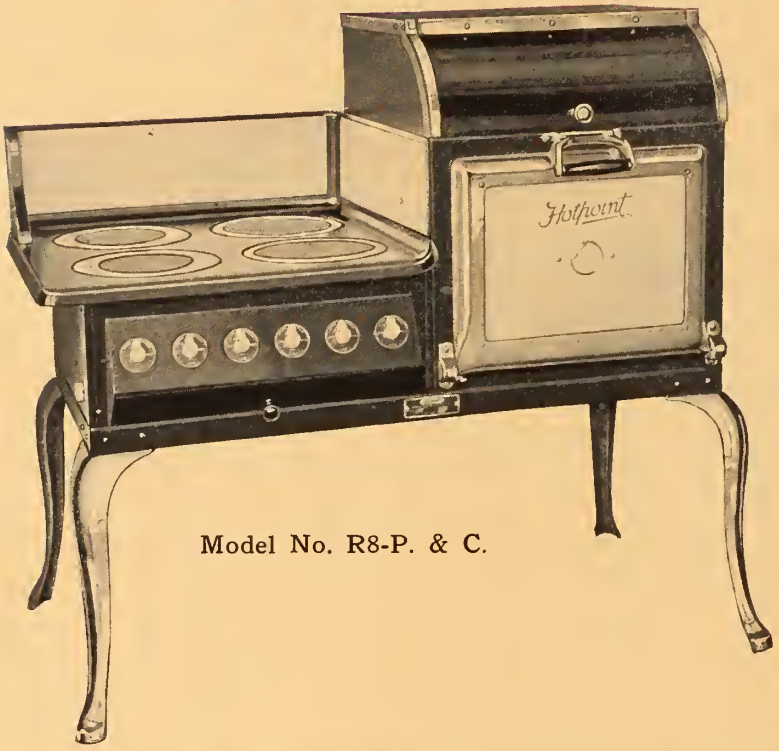
HEAD OFFICE TORONTO

Branch Offices: Halifax, Sydney St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

Announcing the New

Hotpoint

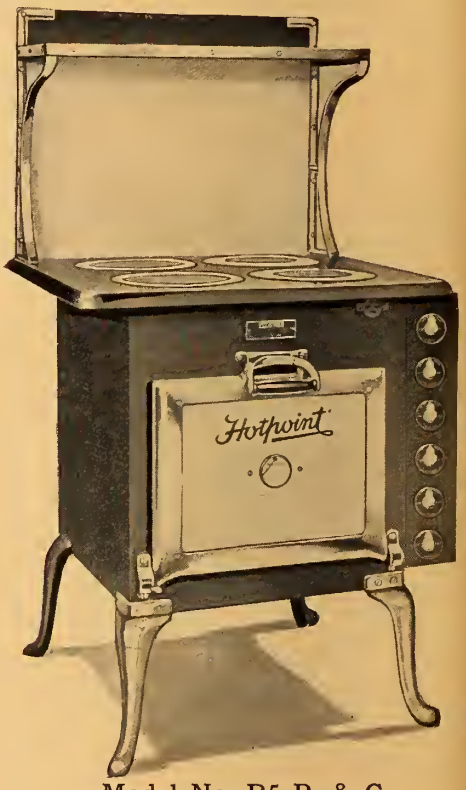
Ranges



Model No. R8-P. & C.

THIS low oven model is ideal for use in homes and apartments where floor space is at a premium but where ample cooking capacity is essential.

The oven construction is identical with the R8 Cabinet type. Patented sheathed wire oven elements upper and lower 1200 Watt. The oven construction is standard on P. & C. Types.



Model No. R5 P. & C.



THE new R8 model retains its unique feature of having 40% less surface to clean than the standard cabinet type of range.

The oven is of the flush type with smooth rounded corners and has a vitreous enamelled surface which will not rust. The oven parts including the elements may be removed for cleaning, leaving only the four enamelled walls of the oven which are as easy to clean as the top of a piano. The surface elements consist of one 8½" 1600 Watt and three 6½" 1000 Watt patented cast-in sheathed wire elements.

"Hotpoint Sheathed Wire elements are the fastest protected elements made"

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited

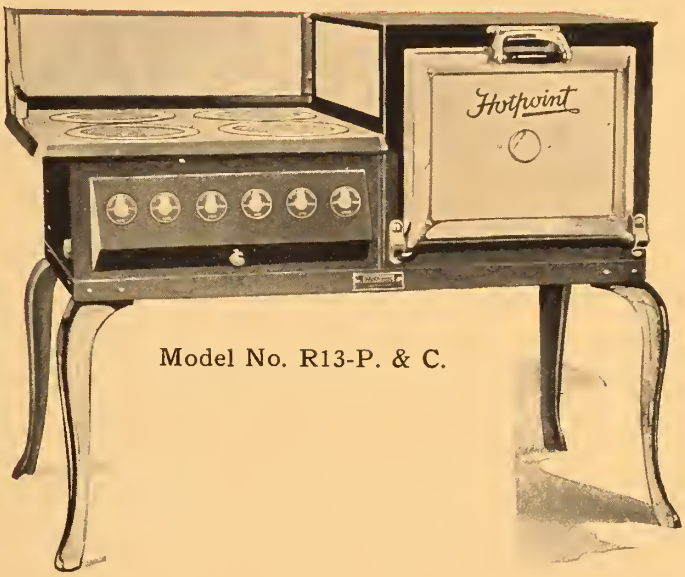
Complete with—

Sheathed Wire Elements

(Patented)

MODEL R13 has been designed especially for use in kitchens where it is necessary to place the range in front of a window. This range is so constructed that it will not obstruct the light and yet provide ample cooking surface and a full sized oven.

The oven is the same size as the Model R8 as is also the cooking surface. A feature of the new Hotpoint oven lies in the fact that the oven elements are removable and interchangeable one with the other.



Model No. R13-P. & C.



Model No. R11-R11-P

MODEL R11 is a low priced type, built especially for kitchenette use. The oven lining is vitreous enamelled and will not rust. The cooking surface is 21 by 30 inches and the oven 13 by 18 by 13". A high shelf can be supplied if desired. The R11 is equipped with open coil surface and oven elements. The surface elements consist of one 8½"—1700 Watt and two 6½"—900 Watt. R11P is equipped with patented cast-in sheathed wire elements one 8½"—1600 Watt and two 6½"—1000 Watt.



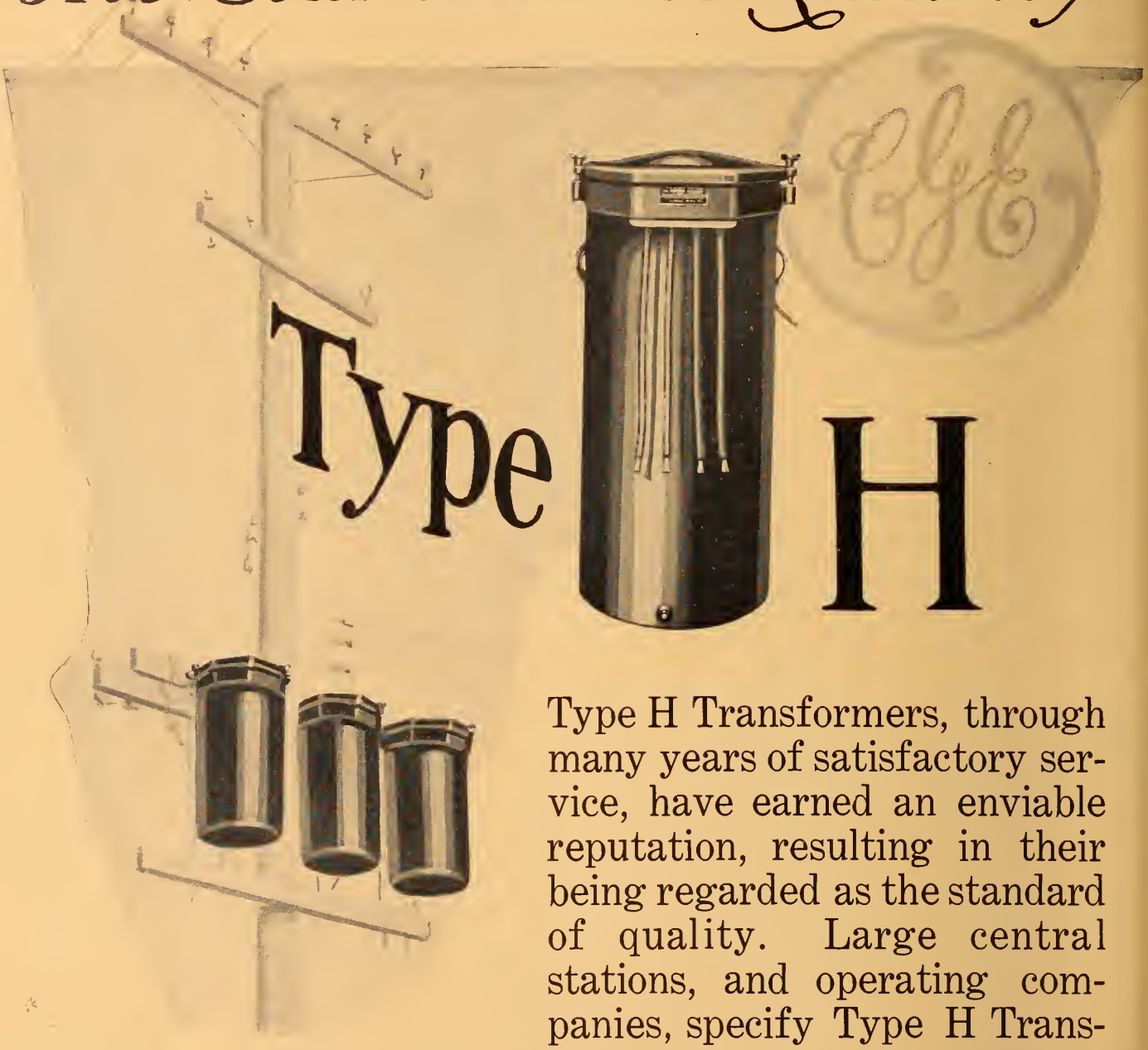
"Hotpoint Sheathed Wire elements are the fastest protected elements made"

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The Standard of Quality



Type H

Type H Transformers, through many years of satisfactory service, have earned an enviable reputation, resulting in their being regarded as the standard of quality. Large central stations, and operating companies, specify Type H Transformers because of their long life, and excellent operating characteristics. Low depreciation rates, and uninterrupted service will eventually win on any system.

"Made in Canada" by

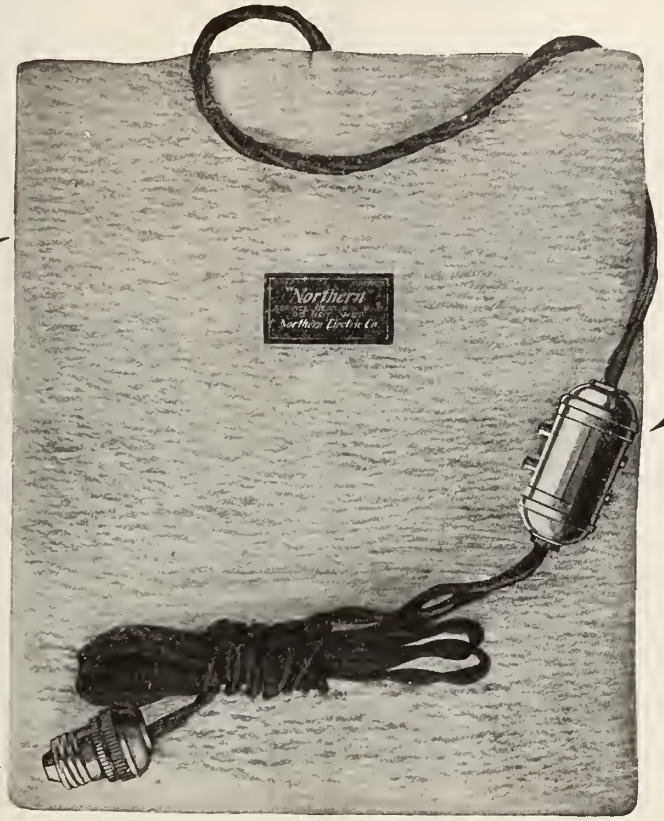
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"Northern" Pads and Curlers

Covered with soft eiderdown
(In assorted dainty Colors)

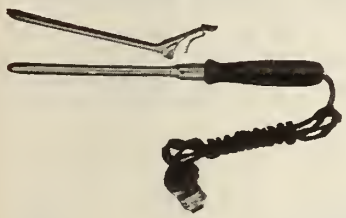


Three Heat C-H switch

Two-piece plug— Ten feet of cord

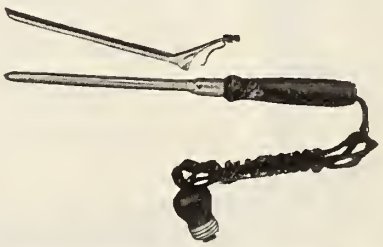
Size 12" x 15"

No. 77
Waver and Curler 10½ x 5/16



USEFUL AND DEPENDABLE ELECTRICAL —GIFTS—

No. 55
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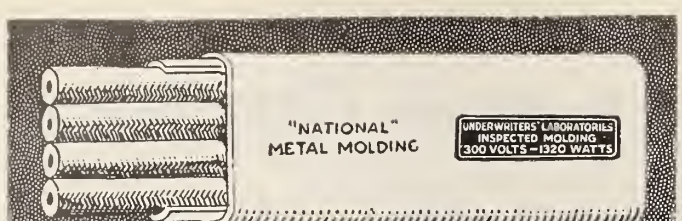
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Manual Telephones
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It is the standard for surface wiring in either new or old work. It is a little less than one inch wide and one-half inch deep over all and will carry a maximum of four No. 14 or three No. 12 Single Braid Wires. There is also a complete line of Metal Molding Fittings to insure neat and inconspicuous work. Metal Molding may be painted any color — its Sherardized (rust proof) surface readily receives and holds either water or oil paints.

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—against 20,000 volts, on the pole, on the ground, or in conduit work.

They Use MARSHALL'S LINEMEN'S Shoes and Shields

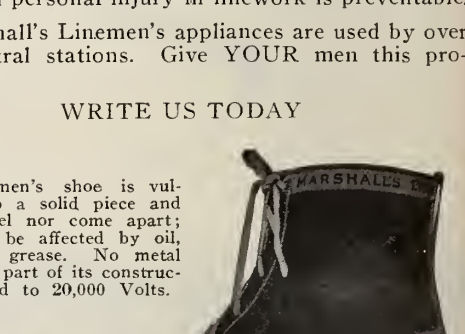
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Marshall's Linemen's appliances are used by over 1,000 central stations. Give YOUR men this protection.

WRITE US TODAY

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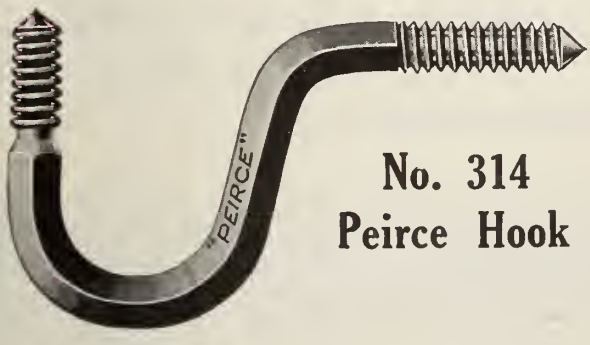
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No. 314
Peirce Hook

The line at the extreme left of this picture is carried on No. 314 Peirce Hooks. These are largely used in South America for supporting wires on poles, trees and houses.

The superior hot-dip galvanizing on these and all Peirce pole line hardware withstands extreme climatic conditions.

The steel spring insulator threads on the Peirce give special satisfaction.

Ask your jobber

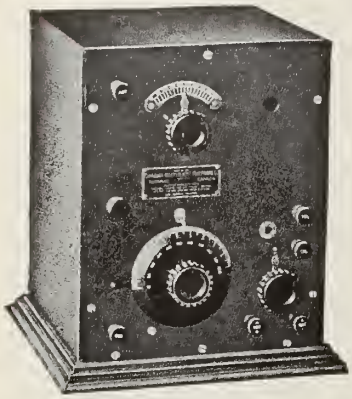
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When it is for one of our Radio Receiving Sets

BECAUSE



SC 10. Receiver



Universal Receiver

When compared with other sets the difference in quality of reception is easily noted.

Anyone can see by examining our sets that nothing cheap enters into their construction.

They are made in Canada.

As manufacturers of high grade telephone apparatus for many years our reputation is firmly established.

Our prices are lower than expected for sets so well designed and made.

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We offer the Electrical Dealer an opportunity to get into the Radio business in a profitable way.

Now is the time to sell Radio Sets. Write us today.

Canadian Independent Telephone Co., Limited

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Manufacturers of Telephone and Radio Equipment

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The Unit Beautiful

Combined qualities of beauty, efficiency, service, cleanliness and adaptability.

Beautiful Appearance.
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Supplied only in "Cased-Glass" which we have recently perfected and improved.

The purest of soft white light rays in volume, not intensity, giving an efficient distribution of light not equalled in other glasses.

Our Cased-Glass has been adopted by the Toronto Board of Education

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1061	14″	8″	6″	1/3 "	70 "
1062	16″	9″	6″	1/6 "	70 "
1063	18″	10″	8″	1/12 "	60 "

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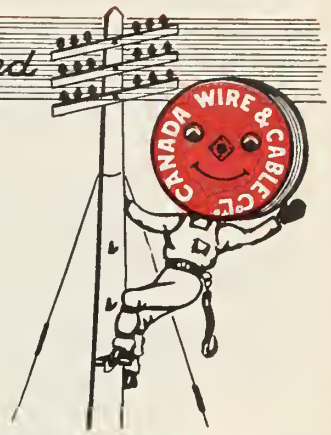
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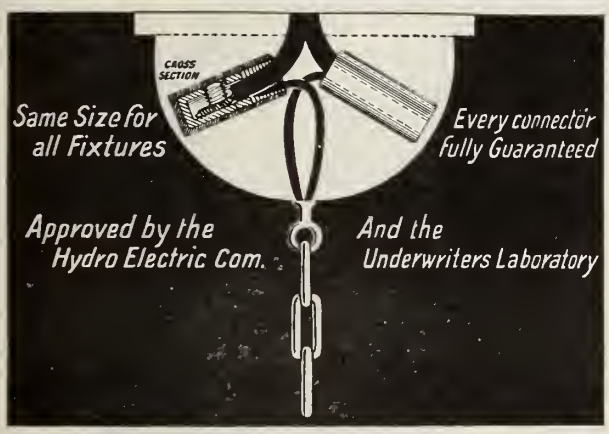
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PATENTED 1923



Twist the Wires Together, That's All You Need to Do, Put Them in The Brass Insert, And Tighten Down the Screw. Then Screw On Insulating Cap And YOUR JOINT IS MADE At That.

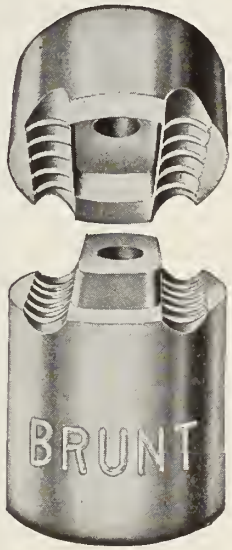
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Better broadcasting, greater simplicity, and new low list prices now make every home a real prospect for Marconi Radio.

Complete Sets

$55.00

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$100.00 and $105.00

With each set is supplied our Complete Instruction Booklet which ensures the purchaser of the best that radio offers.

Though the demand is greater than ever we are making prompt deliveries and are in a position to open up a number of new accounts with Electrical Dealers. The trade discounts are attractive and the capital outlay is low.

Many of our most successful agents are in the Electrical business and knew little or nothing about radio a few months ago. Our complete instruction book provides the dealer with all the technical information necessary.

Marconi Radio will be largely advertised during the coming months. If you are out to turn the Fall and Winter months to good account, write now for our dealer proposition.

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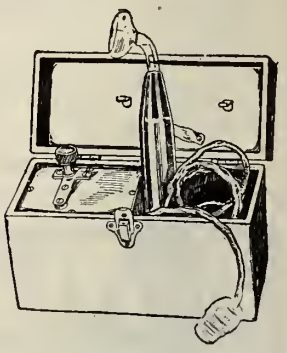
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The STAR-Rite Line

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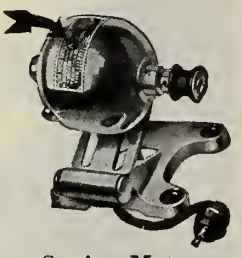
Motor Vibrator
Retails $17.50



Violet Ray
Retails $17.50



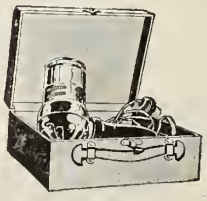
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As the Days Grow Shorter

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This Space is Available

This two color attractive space is available at a cost of only $60.00 per inch, per year of 24 issues reaching 3,500 electrical men throughout Canada. The above firms whose cards are shown find this small space especially valuable and many of them have been with us for years.

Write to-day!

Electrical News
349 Adelaide Street West, Toronto



Let "Canadian Beauties" Bring You Gift Business

We're looking for a bumper business in "Canadian Beauty" Electrical Appliances between now and Christmas. How are **you** fixed for the big selling season?

Our advertising in the newspapers will be sending "Canadian Beauty" customers in your direction. Electrical Appliances promise to enjoy exceptional popularity as Christmas Gifts this year.

Go After the Lion's Share

Dealers who carry complete stocks of "Canadian Beauty" Appliances and display these superior goods prominently will inevitably get the lion's share of the business. We hope you figure on being a lion, by linking your sales efforts up closely with our advertising.

Profits and Premiums For You

You've a **double** reason for keeping Majestic Heaters moving. There are real profits in selling our three styles—No. 3 "Canadian Beauty", No. 7 single-coil "Majestic" and No. 8 two-coil "Majestic. The cream of the business ought to come at this season.

The extra incentive to pushing "Majestic" sales lies in the five Free Premiums, one or more of which every dealer can win. All Heater orders up to the end of the year count, and the time for running up a big total is between now and Christmas.

Order Early and Be Sure

Send in liberal orders for both "Canadian Beauty" Appliances and "Majestic" Heaters—and do it **now**. Eleventh hour orders are subject to delay, and you cannot afford to miss either Appliance or Heater Sales.

CANADIAN BEAUTY ELECTRICAL APPLIANCES

Renfrew Electric Products, Limited

General Sales Office:
29 Richmond St. W.
Toronto, Ont.

Factories: Renfrew, Ont.



Two attractive offers

Pay less for your appliances by ordering National Christmas packages

THE National Christmas package is an assortment of best sellers which you can purchase for holiday trade at a price which allows you a greater margin of profit.

National Electric Heatray, Toasters and Irons, are now available in Christmas boxes wrapped in attractive holly paper.

Every live dealer knows this means big business. National Electric appliances are ready-selling Christmas favorites even in ordinary wrappings.

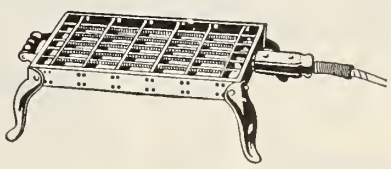
Now they lend themselves to attractive Christmas window displays — this alone means a handsome boost in sales. Our special reduced Christmas prices will mean increased profit for you.

Write to-day to your jobber or direct to us for information regarding these two exceptional offers.



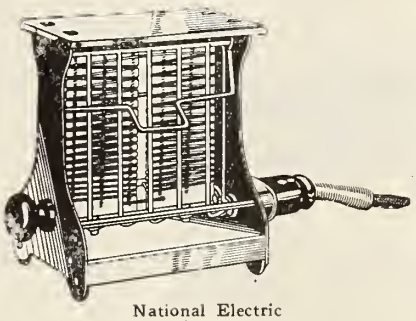
National Electric Heatray

Extra attractive design; well made; safer, quicker heat



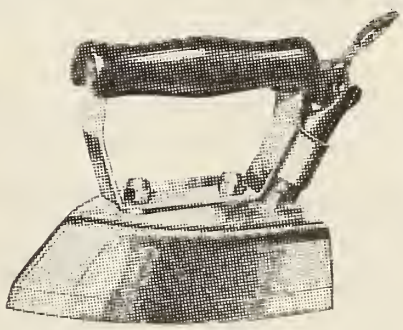
National Electric Toaster Stove

Large cooking surface; removeable bottom, a quick seller



National Electric Toaster

Neat and serviceable. A Christmas favorite



National Electric Iron

Cool handle; handy back stand. Every modern improvement

National Electric Appliances

National Electric Heating Co.
Limited

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"THE NATIONAL AUTHORITY ON ELECTRIC LIGHTING"

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WITH INCANDESCENT ELECTRIC LAMPS
COMPILED BY A STAFF OF EXPERTS

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272 Pages—240 Illustrations and Diagrams—55 Tables
—Leatherette Cover—Gilt Edges

PUBLISHED BY H. C. CUSHING Jr.

Sent Post Paid to Any Address on receipt of $3.00
Elcctrical News, 347 Adelaide St. W., Toronto, Canada

Wood Pipe. Wood Tanks. Woodstave Penstocks.

Our Double Steel Coupling Wood Pipe
is
Wood Pipe that is Different

Stronger More Durable Leakproof

Also

The combination of the Double Steel Coupling and a double asphalt-saturated burlap coating produces a pipe that is suitable for any waterworks service.

Write for descriptive folder.

Prices gladly submitted on receipt of specification giving sizes, quantities and pressures.

Vancouver Wood Pipe & Tank Co. Ltd.,
850 Hastings St. W., Vancouver, B.C.
Eastern Representatives:
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Chromel
MARSH ALLOYS

Stands the Heat



It won't scale off. It stands high temperatures better than any other alloy known. It is made in all sizes for Electrical Heating devices. Can you use an element like this?

Write for full particulars.

MADE IN CANADA

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Canadian Armature Works
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Electrical Repairs Power Installations

Manufacturers

Motors Commutators Transformers

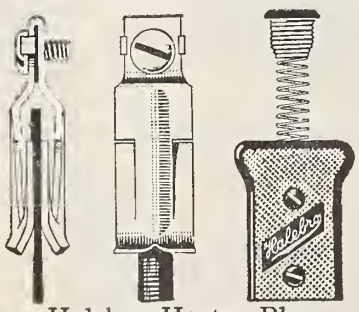
Coils for railway equipment

Armatures rewound, any type of coil manufactured

Write us for prices on
Motors, Coils and Repairs

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Improved Halebro Heater Plug



Halebro Heater Plug

These clips are made of selected spring brass, designed to fit perfectly on either round or flat terminals. THEY WILL NOT ARC.

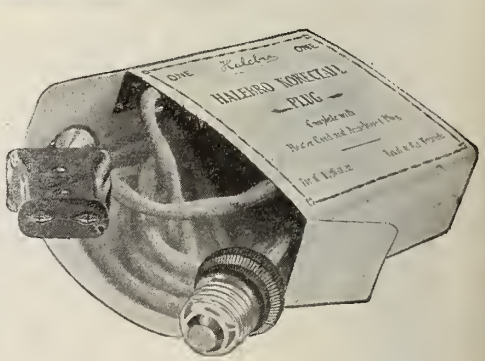
This feature assures long life and satisfaction.

Hydro Electric approval No. 406

Order from your jobber

Manufactured by

Hale Bros. 435 St. Paul West
Montreal



Halebro Renewal Cord Complete

QUEBEC STOCK

PERFECT MICANITE INSULATOR REG. U.S. PAT. OFF. and PERFECT EMPIRE INSULATOR REG. U.S. PAT. OFF.

MICANITE PLATE NO. 1
For general moulding purposes, milled to specified thickness.
MICANITE PLATE NO. 11
For general moulding, but is not exact as to thickness.
MICANITE PLATE NO. 2
For Commutator Segments, white mica, accurately milled, non shrinking 95 to 97% pure mica.
MICANITE PLATE NO. 3
For Commutator Segments, amber mica, closely milled, non shrinking 95 to 97% pure mica.
MICANITE PLATE NO 5
For cold moulding or bending; can be cut into strips with shears.
EMPIRE CLOTH NO. 5
Cambric base, oil treated, high dielectric, flexible, stands up under heat.
EMPIRE CLOTH NOS. 7 to 15
Same as No. 5 but heavier cloth and progressively heavier insulation and dielectric qualities.
EMPIRE CLOTH NOS. 22 and 32
Duck base, great mechanical strength, impervious to moisture
LINOTAPE
Empire Cloth in tape form, straight and bias cut ¾", 1" and 1½" wide.
EMPIRE PAPERS NOS. 104 and 115.
Kraft base, oil treated, thin yet high tensile and dielectric strength.
EMPIRE PAPERS NOS. 107 and 109
Gray rope, similar to No. 104. Supplied in sheets or tapes.
FISH PAPERS
Very tough and dense, yet flexible and a good insulator.
Plain: 15 and 25 thousands and 1/32" thick.
Paraffined: 5, 10, and 15 thousands and 1/32" thick.
FULLER BOARD
Pliable, smooth, tough, glazed insulating board.
8, 10, 15 and 20 thousands and 1/32" thick.

MICA INSULATOR CO.

Canadian Office: VICTORIAVILLE, QUEBEC
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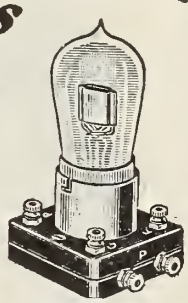
Molded AICO Insulation



WHEN you require Molded Parts for Radio, Electrical and other purposes, have our Engineering Department advise and assist you to simplify your problems. Our large Manufacturing Plants will take care of your requirements.

AMERICAN INSULATOR CORPORATION
New Freedom, Pa., and Danbury, Conn. U. S. A.
Represented in Canada by
G. L. MacGILLIVRAY & CO., LIMITED
3 St. Nicholas St., Montreal, P.Q.

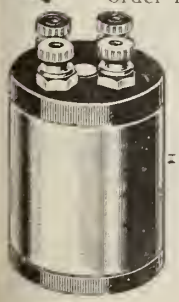
Two New Items in UNITED Radio Line



United Radio Frequency Transformer and Tube Socket Combined $3.50

Never before have such high grade Radio Frequency Amplifying Transformers been offered at anything like the price. Dealers everywhere are ordering these two quick selling money makers.

The enviable reputation United Condensers—and Audio Frequency Amplifying Transformers have made has justified dealers in placing their orders at once for these two new products. Send your order in today.



$2.50 **United Radio Frequency Transformer**

Write for illustrated folder and discounts

United Mfg. & Dist. Co.,
9708 Cottage Grove Ave., Chicago
N.Y. Offices: 50 Church St., New York
San Francisco Office: 709 Mission St.

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Apartment House, Factory, School, Hospital, Office

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A complete new silent call system for hospitals. Registers at nurses' quarters and office with time record, if wanted.

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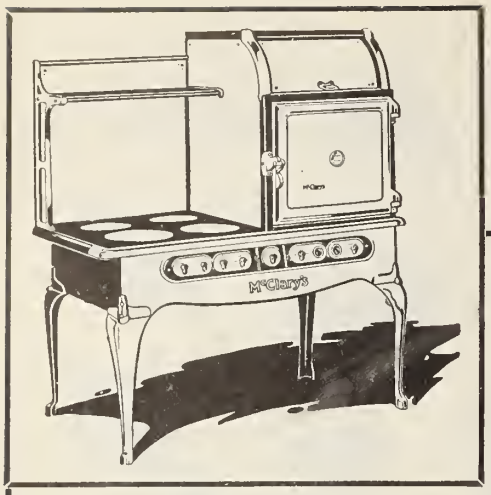
Cochrane, Stephenson & Co. Ltd.
265 Portage Ave.
Winnipeg, Man.

Cochrane, Stephenson & Co. Ltd.,
850 Hastings St.
Vancouver, B.C.

Timberlake & Bourne
New Birks Bldg.,
Montreal, Quebec

The Pierce Electric Company,
104 Richmond St. West,
Toronto, Ontario

CONNECTICUT TELEPHONE & ELECTRIC COMPANY
MERIDEN CONNECTICUT



The Supreme Electric Range

McClary's two exclusive features, the **Tor-red protected porcelain element and the perfectly insulated round cornered seamless enamelled oven,** places McClary's electric ranges at the peak of electric ranges.

Every electrical dealer should understand the real value of linking up with the McClary's advertising, business prestige and aggressive promotion methods.

McClary's London, Toronto, Montreal, Winnipeg, Vancouver, St. John, N. B., Hamilton, Calgary, Saskatoon, Edmonton.

McClary's Electric Range

"The only Range with the "TOR-RED" Protected Element"

NUMBER 8

This is the eighth of a series of ten advertisements

The Line that R. and I. E. Co. Builds!

This is the Steel Base

That carries the R. & I. E. Interchangeable Insulator Units with Forged Steel Pins and Pressed Steel Caps. No clamps, no screws

That supports the Type "IB-2" Horn Gap Switch. (Bulletin 1331)

and the Type "WB-2" Horn Gap Arrester (Bulletin 1600)

and the Type "F-2" Fuse Holder with Glass Cartridge Fuse (Bulletin 15001

That makes up

One of the many combinations obtainable with R. & I. E. Interchangeable Insulator Unit Equipment. Built for a particular purpose—to give service at a minimum cost

Interchangeable Unit Substation Combinations that R. and I. E. Co. Builds

R & I E Interchangeable Insulator Unit Equipment for outdoor service includes Bus Supports, Disconnecting Switches, Air Break Horn Gap Switches, Choke Coils, Fuse Holders, Lightning Arresters, Substation Combinations and Outdoor Steel Substations.

Manufactured by

Railway and Industrial Engineering Co.
Greensburg, Penna.

8



Cat. No. 5056

A New Heavy Design which is proving to be popular for 300 W or 500 W Lamps Supplied with either Holophane Refractor or Globe.

Cat. No. 5056

We also solicit your enquiries for the products of

Weston Electrical Instrument Co.
The Bristol Co.
Metric Metal Co.
Albert & J. M. Anderson Mfg. Co.
Philadelphia Electrical & Mfg. Co.
Railway & Industrial Engineering Co.
General Devices & Fittings Co.
G & W Electric Specialty Co.

Powerlite Devices, Limited

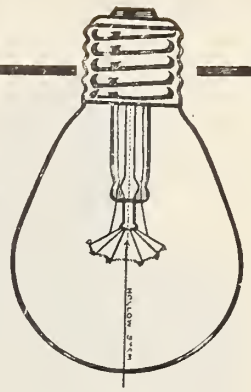
Formerly

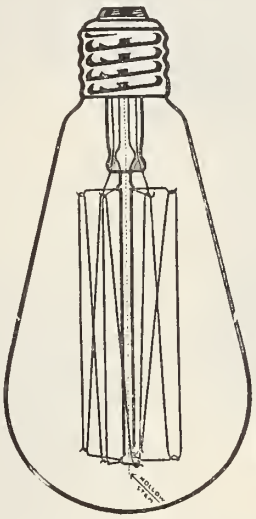
A. H. Winter Joyner Limited

62 Front St. West, TORONTO

New Birks Bldg., MONTREAL

They'll all be selling them soon ---be one of the live dealers who are selling them now!

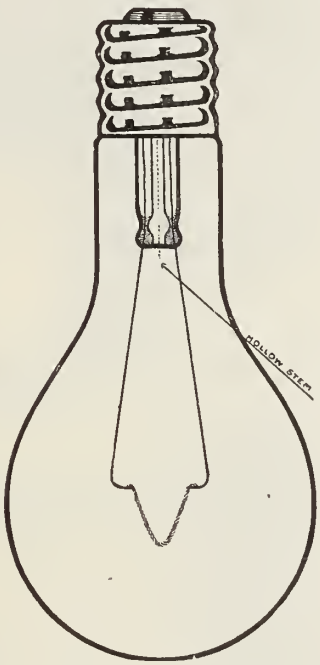




TUNGSTEN MILL TYPE GAS FILLED

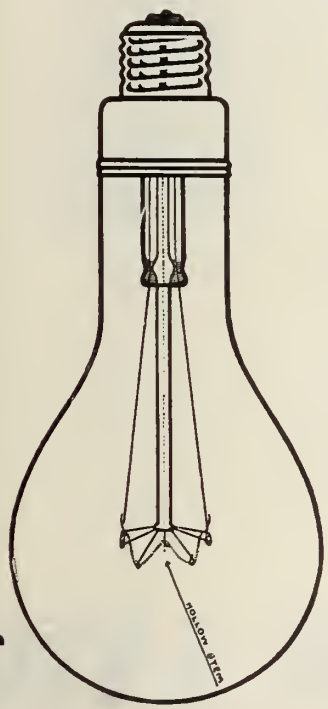
The DALYTE "HOLO-STEM" TIPLESS LAMP is the final word in incandescent lamp manufacture.

There is nothing else like it on the market, because we are protected by patents pending.



DALYTE "HOLO-STEM" TIPLESS LAMPS are selling in ever-increasing quantities from coast to coast. Their selling qualities are, therefore, established.

Get your order in now—any of our distributors listed below will give you courteous attention.



Head Office and Factory:

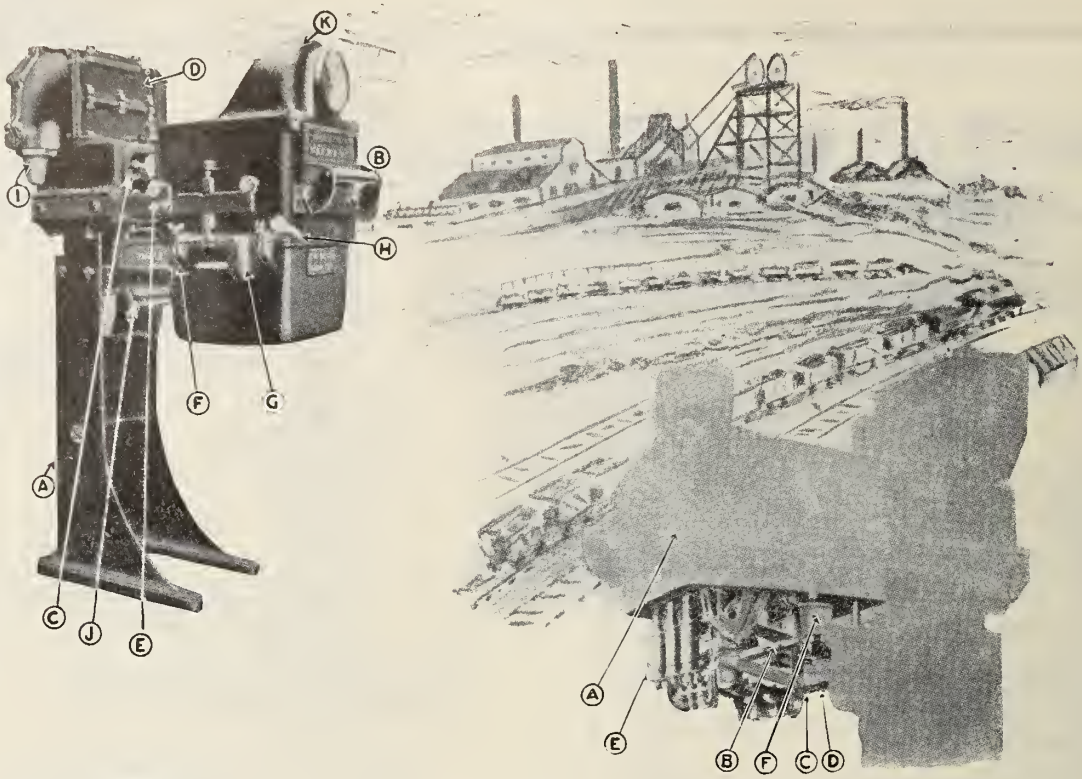
DALYTE ELECTRIC LTD.

GUELPH, ONTARIO

Branches, Sales Offices and Distributors are:-

La Cie des Nouveautes "UNIVERSEL", 211 Rue Des Fosses, Quebec City
H. M. Hopper, 57 Dock St., St. John, N. B.
Sumner & Co. Limited, Moncton, N. B.
Dalyte Electric Ltd., 556 Aylmer St., Montreal
Dalyte Electric Ltd., Sanford & Main Sts., Hamilton
Dalyte Electric Ltd., 163½ Church St., Toronto
E. H. Briggs & Co., 619 Avenue Bldg., Winnipeg, Man.
Stratton-Steward Ltd., 239—10th Ave. East, Calgary, Alta.
The Western Lighting Agencies, 109—23rd St. East, Saskatoon, Sask.
Dalyte Electric Ltd., 325 Howe St., Vancouver

TIPLESS *Dalyte Holo-Stem* **LAMPS**



For Factory & Mine

Ironclad switchgear expressly designed for bad industrial situations. Dust proof, drip-proof and vermin-proof; capable of resisting bad atmospheric effects. A flame-proof pattern is available. All live connections immersed in oil or compound. Constructed on the sectional principle for wall or floor mounting.

UPPER FIGURE

A. Pedestal light in weight, extremely rigid.
B. Ironclad oil immersed circuit breaker, draw-out pattern.
C. Connection or isolating chamber.
D. Bus-bar chamber or terminal box. Made in halves to facilitate installation. Compound filled.
E. Definite stop to prevent overrunning carriage.
F. Interlock on oil tank. Complete interlocking system is fitted.
G. Oil level gauge and filling arrangement.
H. Gravity controlled lever for cutting out overload releases.
I. Cable fittings for all classes and sizes of cables.
J. Hinged door to shield receptacles after removing circuit breaker carriage.

LOWER FIGURE

A. Circuit breaker carriage, can be padlocked.
B. Free handle operated by simple toggle mechanism with accelerating springs and oil dash pots.
C. Moving Contacts of reinforced laminated brush type. Large factor of safety in contact surfaces and insulation.
D. Renewable auxiliary break contacts.
E. Time limit attachments can be provided.
F. Fixed Contacts mounted on substantial bakelite bushings.

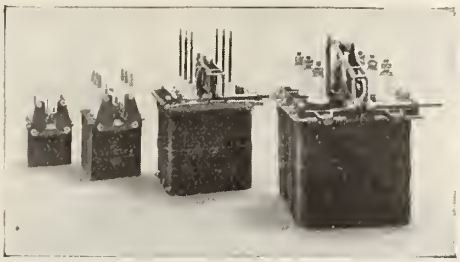
Write for Catalogue Section 160, A2

FERGUSON, PAILIN LTD.

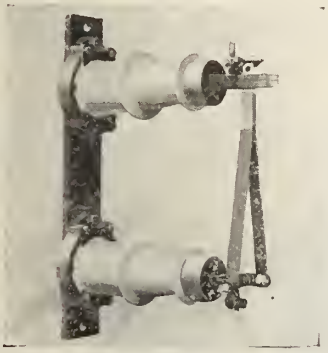
Canadian Office and Warehouse:

321 KING STREET EAST, TORONTO, ONT.

Frank H. Girdlestone, 132 James St., Winnipeg, Representative for Manitoba and Saskatchewan



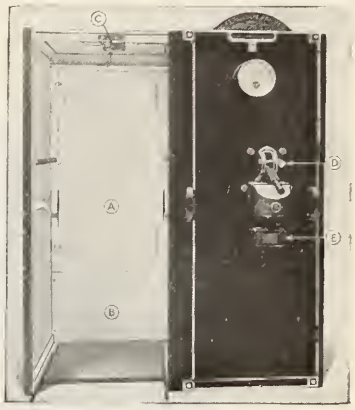
Standard Oil Immersed Circuit Breakers, rupturing capacities 35,000/300,000 K.V.A.



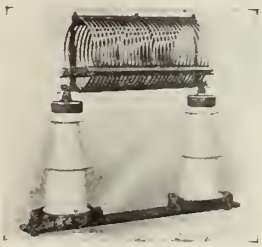
33,000 volt Disconnecting Switch (indoor type)



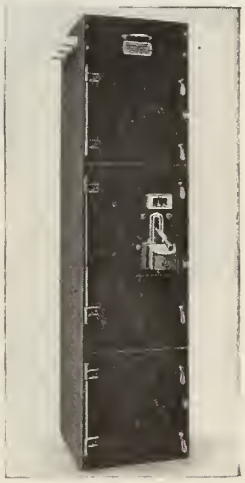
Direct-current Switchboard



Truck type Switchboards



33,000 volt Choke Coil (indoor type)



Standard Non-Interlocked Ironclad Cubicle



88,000 volt Automatic Air Break Switch (outdoor type)

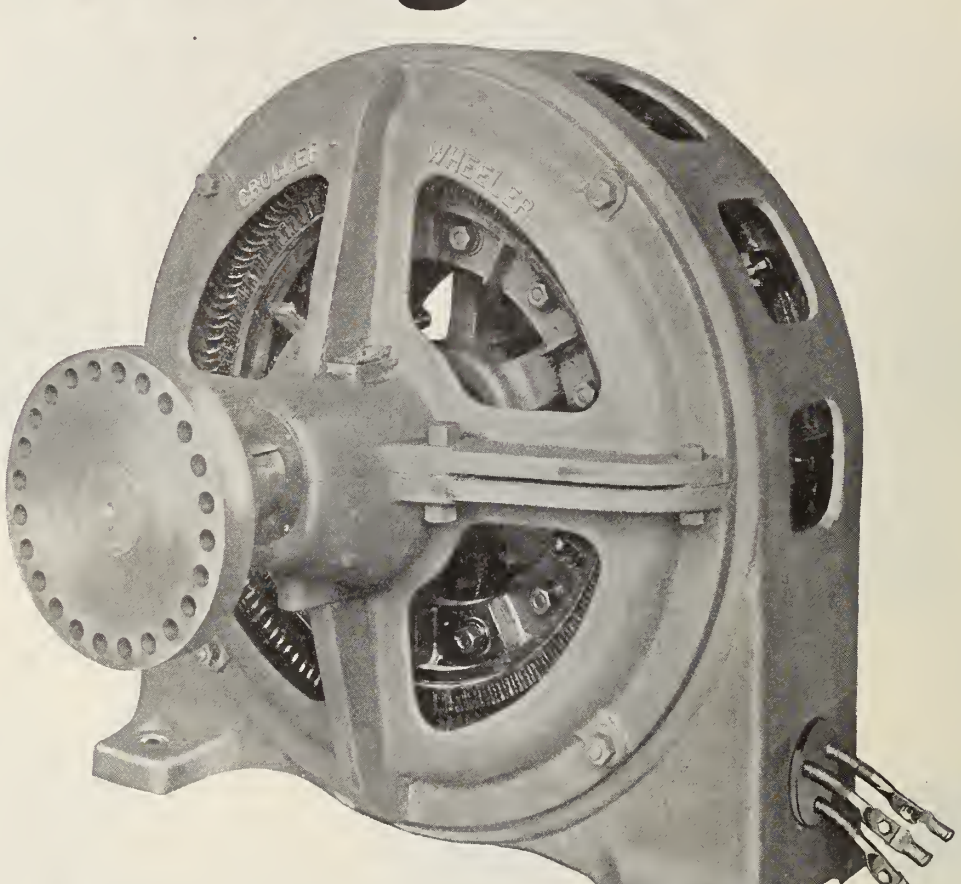
FERGUSON, PAILIN LTD.

Canadian Office and Warehouse:

321 KING STREET EAST, TORONTO, ONT.

Frank H. Girdlestone, 132 James St., Winnipeg, Representative for Manitoba and Saskatchewan

Hoisting Duties



For Mine Hoisting and Haulage

The specially designed Wound Rotor, form wound coils, acid and moisture-proof insulation, split end housings and general construction of the Canadian Crocker-Wheeler Motor make it especially valuable for the exacting duties of mine hoisting and haulage. Liberal allowance is made for the severe and continuous service required of such a motor, and endurance is built in by the wide experience of our engineers.

THE CANADIAN

CROCKER-WHEELER CO.

LIMITED

Manufacturers and Electrical Engineers

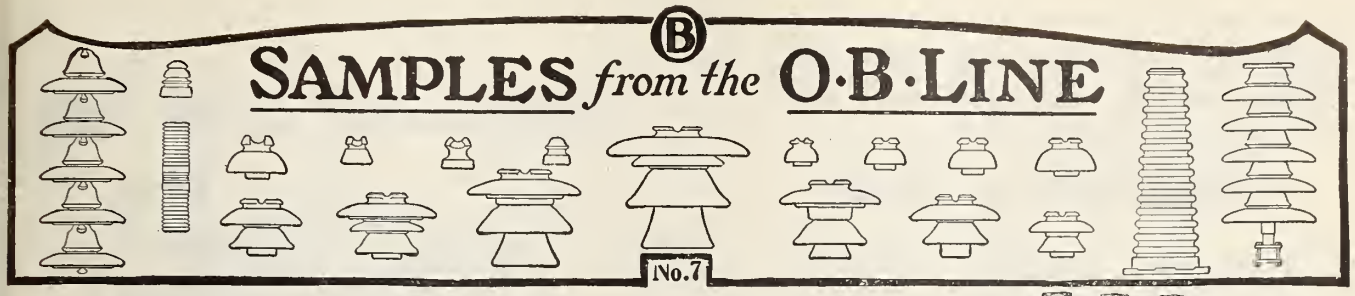
Head Office & Works:
St. Catharines, Ont.

District Offices:
Toronto, Montreal, Sydney, N.S., Ottawa

Also all
Branches of

Northern Electric Company
LIMITED

Montreal, Halifax, Quebec, Toronto, Hamilton, London, Windsor, Winnipeg, Regina, Calgary, Edmonton, Vancouver.



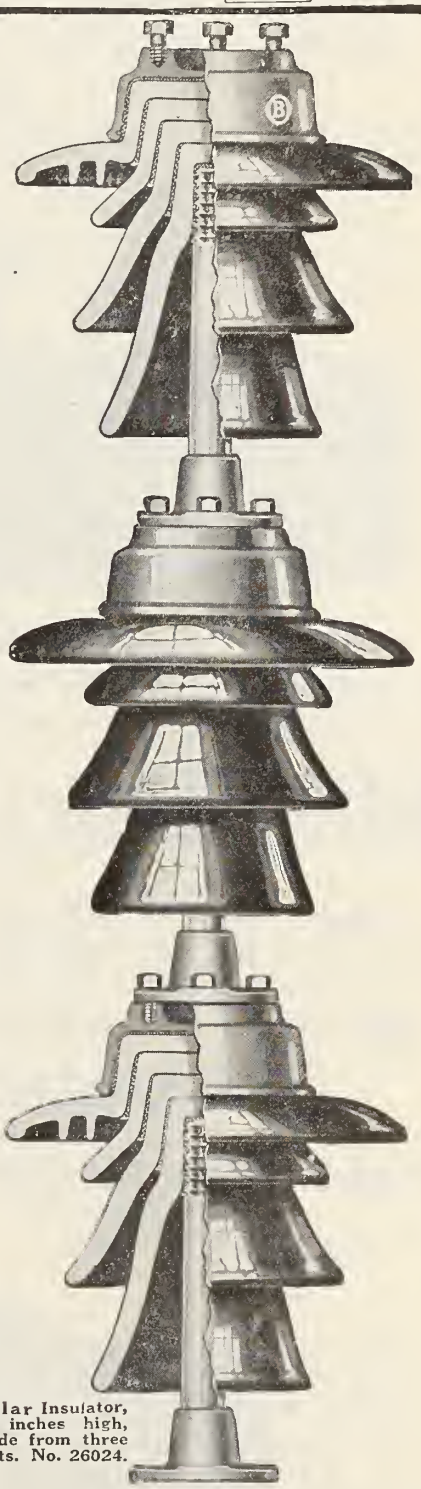
Modern Pillar Insulators

Interchangeable Units for Switch and Bus Bar Use

THE five-foot insulator illustrated here indicates the possibilities of the line of interchangeable pillar insulator units listed in the new O-B Catalog. These units are made in a number of styles and sizes for various conditions of voltage and mechanical loading. Pillar insulators of the desired height are made up by simply bolting together two or more units.

Insulators of this type will carry heavy mechanical loads in any direction, including torsional loads, and are being widely used for high voltage switches and bus bar supports.

All the refinements in manufacture and assembly which have given O-B pin-type insulators their remarkable records for reliability and long life are incorporated in these insulators. Additional refinements which insure great accuracy in the final assembly make each of these units fully interchangeable with others of the same size and type.



Pillar Insulator, 60 inches high, made from three units. No. 26024.

Dominion Insulator & Mfg. Co. Limited

(Manufacturing Ohio Brass Company Products in Canada)

Niagara Falls - - - - - - Ontario

119

KLITZEN

REGENERATIVE—

Receiving Sets

Real Radio Simplicity

Only one adjustment

Licensed under Armstrong Patents

The principal feature of No. 525 Regenerative Tuner Detector, 2-stage audio amplifier is SIMPLICITY.

Any operator can get wonderful results because there is only one adjustment. Receiving Range practically the same as that of the best radiophone equipment on the market.

Each unit carefully tested before shipment. The best material and most highly skilled workmanship employed —it is the product of experts who have been making radio equipment since 1913.

JOBBERS AND DISTRIBUTORS. Write for full information and big discounts. DEALERS—ask your jobber or write us.

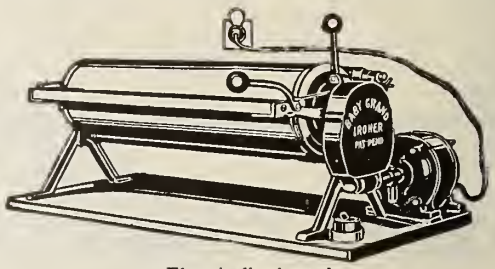
KLITZEN RADIO MFG. CO , Inc.
Racine, Wis.



MODEL No. 525

LIST PRICE $80.00

Small but Sells Big



Electrically heated

BABY GRAND IRONER

"A Household Necessity"

The steady increase in "Baby Grand" sales points to the nice profits which dealers are making. This market has scarcely been touched and now is the time to start getting YOUR share. A card will bring particulars.

INGERSOLL MACHINE & TOOL CO. LIMITED
Ingersoll, Canada

Toronto Office—230 Bay Street
Prairie Provinces:—Fred E. Garrett & Co., 501 Confederation Life Bldg., Winnipeg, Man.

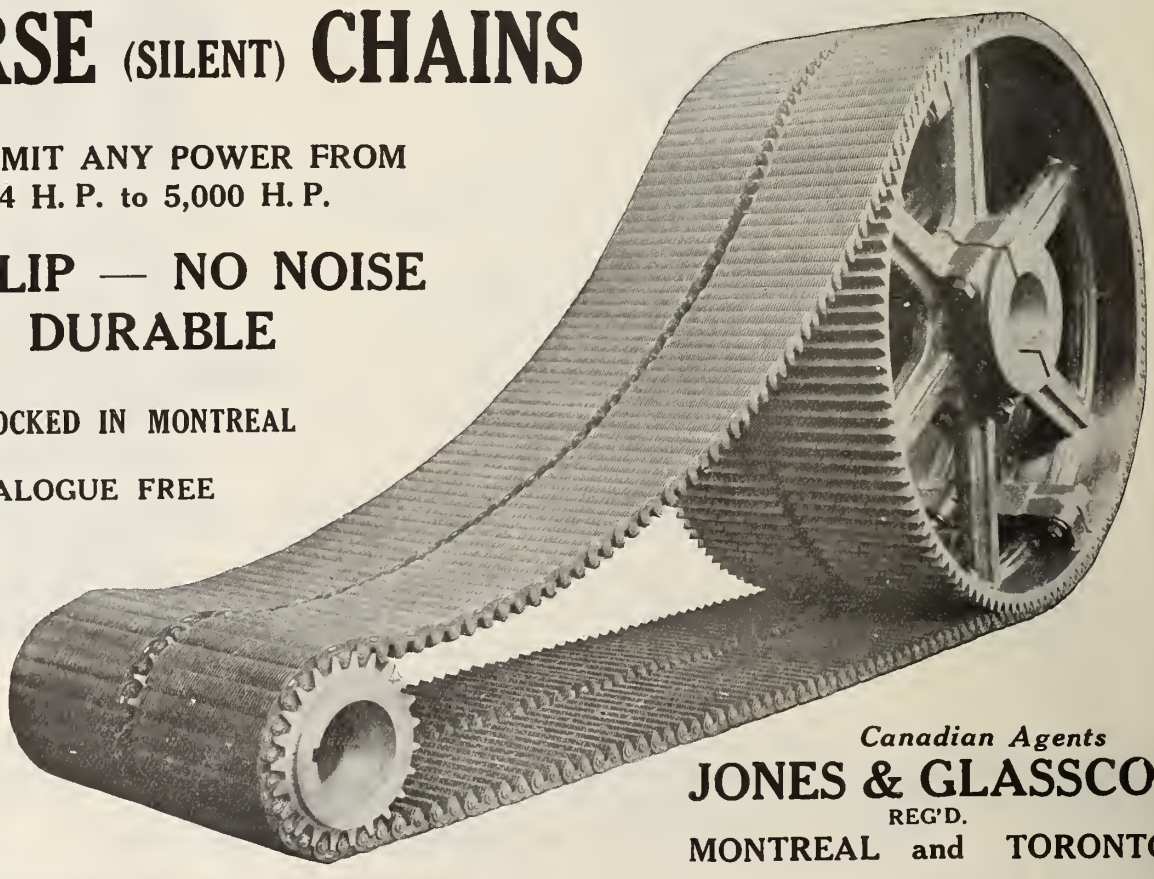
MORSE (SILENT) CHAINS

TRANSMIT ANY POWER FROM 1/4 H. P. to 5,000 H. P.

NO SLIP — NO NOISE
DURABLE

CHAINS STOCKED IN MONTREAL

CATALOGUE FREE



Canadian Agents
JONES & GLASSCO,
REG'D.
MONTREAL and TORONTO

XCELADUCT

Approved by the Hydro-Electric Commission of Ontario
Labelled under supervision of Underwriters' Laboratories

GALVANIZED

Made in Canada Conduit

Electrical Wiring Made Safe

For All Electrical Installations

Manufactured by
National Conduit Co., Limited
Toronto

Conduit Pipe Fittings and Covers

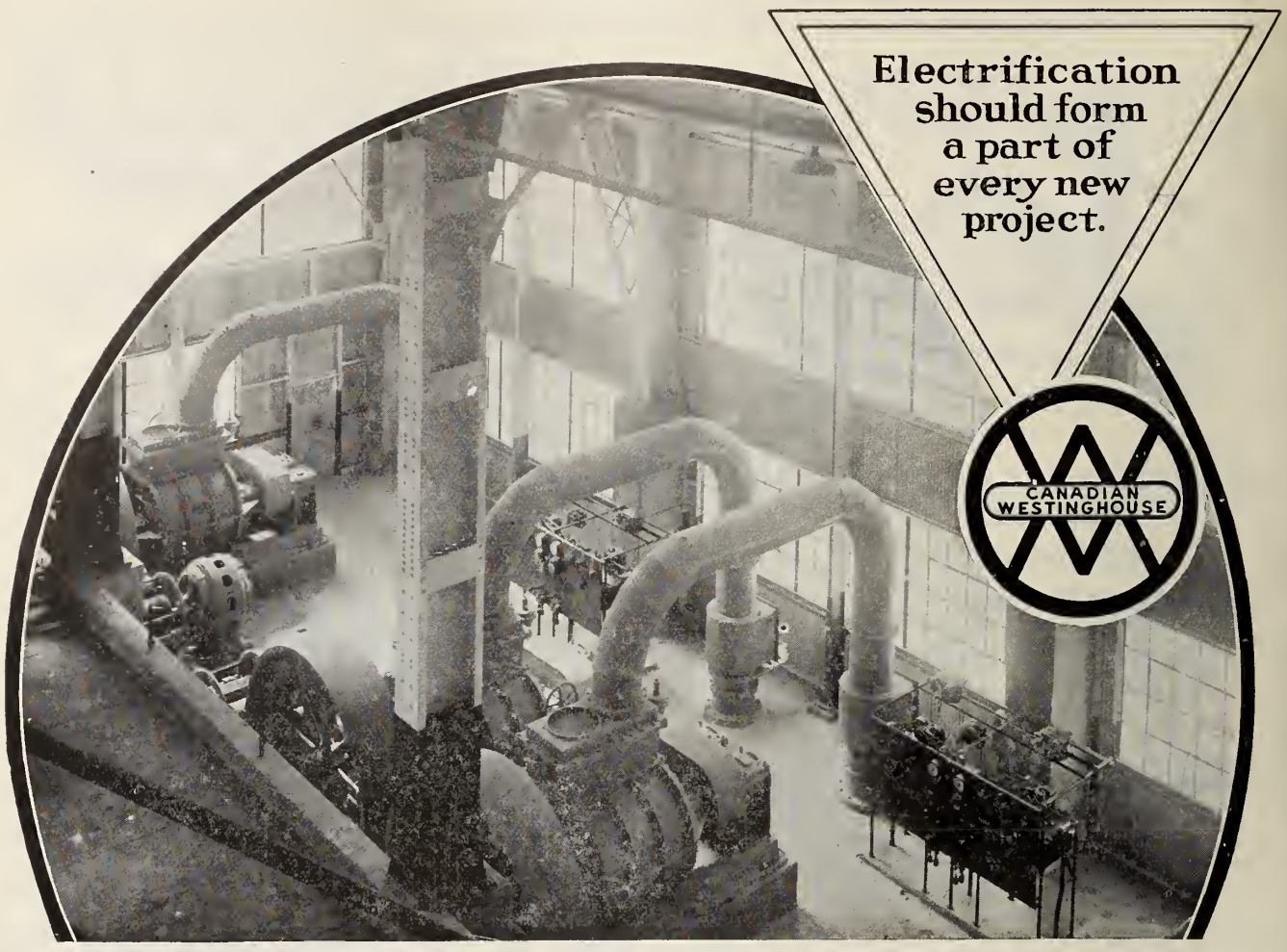
You can do better, neater and quicker work if you use (J/F) Conduit Pipe Fittings and Covers. No makeshifts necessary—there is a fitting for every requirement, whether for mine, factory or other work. Write to-day for sample and price lists. Liberal discounts allowed



Ferguson Mfg. Company Limited

MANUFACTURERS OF
CONDUIT PIPE FITTINGS AND PIPE FITTINGS COVERS
174 King St. - London, Ont.

Western Representatives
Fred E. Garrett & Company
607 Union Trust Building
WINNIPEG
Man.



GET THE RIGHT START

If for no other reason electrification should be made a part of every new project because of the greater flexibility in plant arrangement that it affords. When plant arrangement is handicapped by the limitations of steam drive with its complex line shafting and belts, the handling of materials and other operations, cost more than they should. The cost of production is high while the cost of labor and materials cannot always be lowered to offset this or meet competition.

Fortunately, however, many of the operations and processes in the mining industry are such that the original plant arrangement need not be changed in order to attain the full benefits of electrification. Mine Managers are rapidly taking advantage of this opportunity to lower production costs.

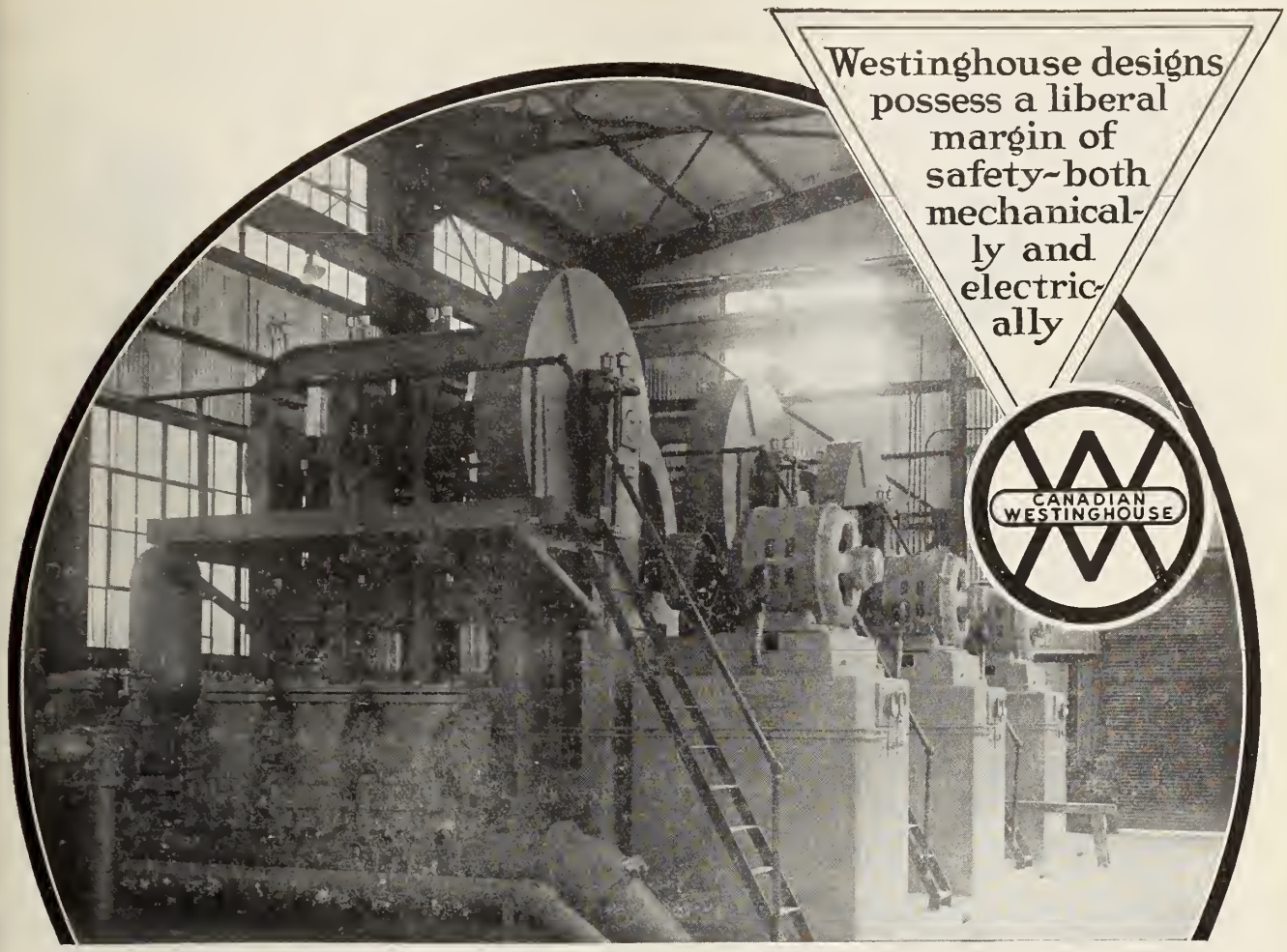
It is advantageous, therefore, to make electrification a part of every new project.

Consultation with Westinghouse engineers in the first place has saved mining companies many thousands of dollars.

Canadian Westinghouse Company, Limited, Hamilton, Ont.

Toronto	Montreal	Ottawa	Halifax	Ft. William	Winnipeg	Edmonton	Calgary	Vancover
Bank of Hamilton Bldg.	285 Beaver Hall Hill	Ahearn & Soper Ltd.	105 Hollis Street	Cuthbertson Block	158 Portage Avenue E.	211 McLeod Bldg.	Canada Life Bldg.	Bank of Nova Scotia Bldg.

Westinghouse



RELIABILITY A FIRST CONSIDERATION

By careful observation of the operation of our equipment in the field, we have been able to improve and to refine our designs, until today they represent the best that engineering skill can devise for mine, mill and smelter.

Westinghouse equipment can always be relied upon because of the unvarying policy of the Westinghouse engineers to allow a liberal margin of safety in design—both electrically and mechanically. Reliability means uninterrupted output.

Next in importance to reliability is the matter of efficiency. High efficiency means low unit cost of production. By proper balance in design high efficiency is obtained without sacrifice of reliability. Service records prove that Westinghouse designs are well balanced.

Canadian Westinghouse Company, Limited, Hamilton, Ont.

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Westinghouse

The DUQUESNE Kitchen Luminaire

Get the "Duquesne" Sales Plan

"New kitchens for old" means a big demand in your town for this handsome marvelously efficient new unit. A sales plan complete that is bringing quick results—it will bring you a steady stream of orders for the "Duquesne."

Order a demonstration sample



Consolidated Lamp & Glass Co.
CORAOPOLIS, PA.
R. E. DAVIS, Canadian Representative
113 Wortley Road, LONDON, ONT.

"Notice the Lighting Equipment"



Tallman Lighting Fixtures

Tallman Fixtures are more and more being recognized as a Quality Line. Fixtures that are well made from heavy weight metal, with lasting finishes. That you don't need to apologize for when offering your customer.

Not cheap, but economical.

MADE IN CANADA BY

TALLMAN BRASS & METAL Limited
Hamilton, Canada

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Portable Lamps

Are you prepared to get your share of the Christmas trade?

Order to-day from the Crown Line and you will then be in a position to supply the demand for a suitable Christmas gift.

The Crown Electrical Manufacturing Company Limited
Brantford - Ontario

The STANDARD OF QUALITY THROUGHOUT ALL CANADA

WIRING DEVICES **Banfield** LOOM & OUTLET BOXES

YOUR JOBBER SELLS THEM!



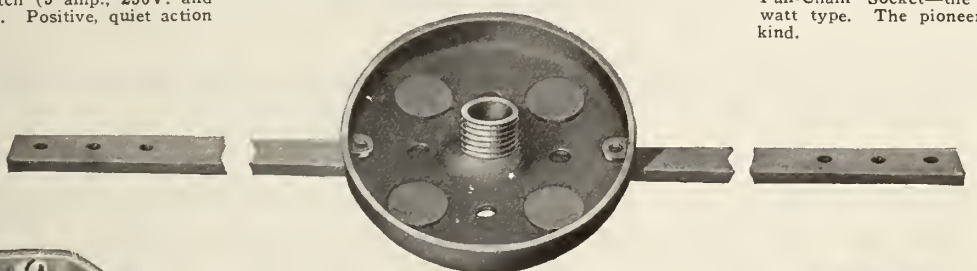
No. 2901—The Banfield Single Pole Flush push switch (5 amp., 250V. and 10-amp., 125V.). Positive, quiet action and long life.



No. 2000—The Banfield 125—250 Volt Surface Snap Switches, with Nickel cover. Quick and quiet in action—a high-grade switch.



No. 65250—The Banfield Levolier Pull-Chain Socket—the approved 660 watt type. The pioneer socket of its kind.

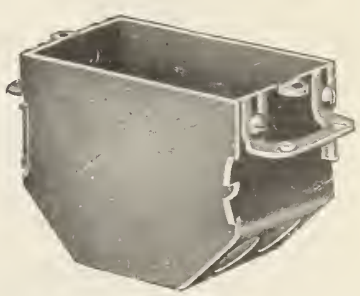


No. 1045—The Banfield 3¼" Loom Outlet Box with bar — is quickly placed in position—has easy knock-outs. Ideal for quick installation.



No. 54151—The Banfield 3¼" Octagon Outlet Box. Used by the majority of electrical men because its easy knockouts mean speedy installation.

The business built on the basis of price has a poor foundation. Anyone can take it away by quoting a lower price. The business built on the basis of quality and service cannot be so easily taken away—but grows steadily because it is founded on SATISFACTION. That's why thinking contractors are turning more and more to Banfield Products. They are the standard of quality.



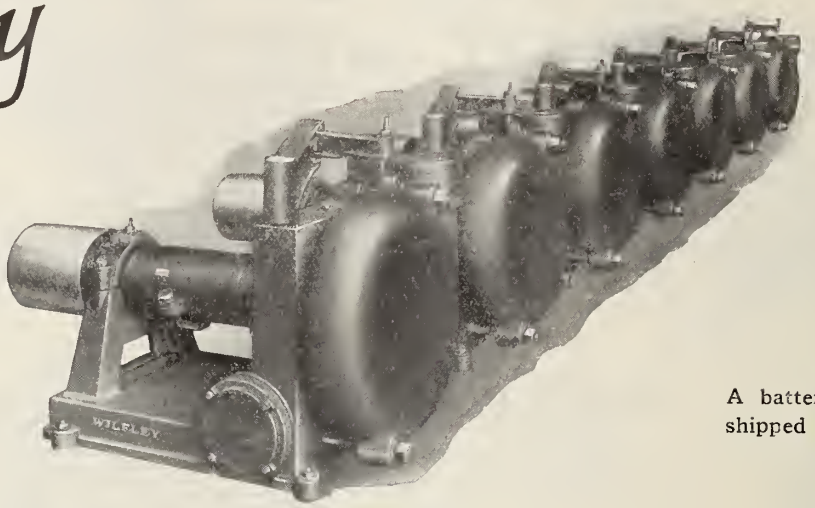
No. 752—The Banfield Loom Switch Box is SECTIONAL. Both side plates are removable. No space required. Boxes can be gauged together.

MADE BY AN ORGANIZATION THAT IS 100 PER CENT CANADIAN

W. H. BANFIELD & SONS LIMITED

370-386 PAPE AVENUE - TORONTO

Wilfley Sand Pump



A battery of 6-inch Wilfleys just shipped to the Chino Copper Co.

It Reduces Costs — It Exceeds Expectations

JUST ask Consolidated M. & S. Co., Hollinger, McIntyre-Porcupine or Granby what they think of Wilfley Pumps—and these are some of the reasons for the answer you'll get:

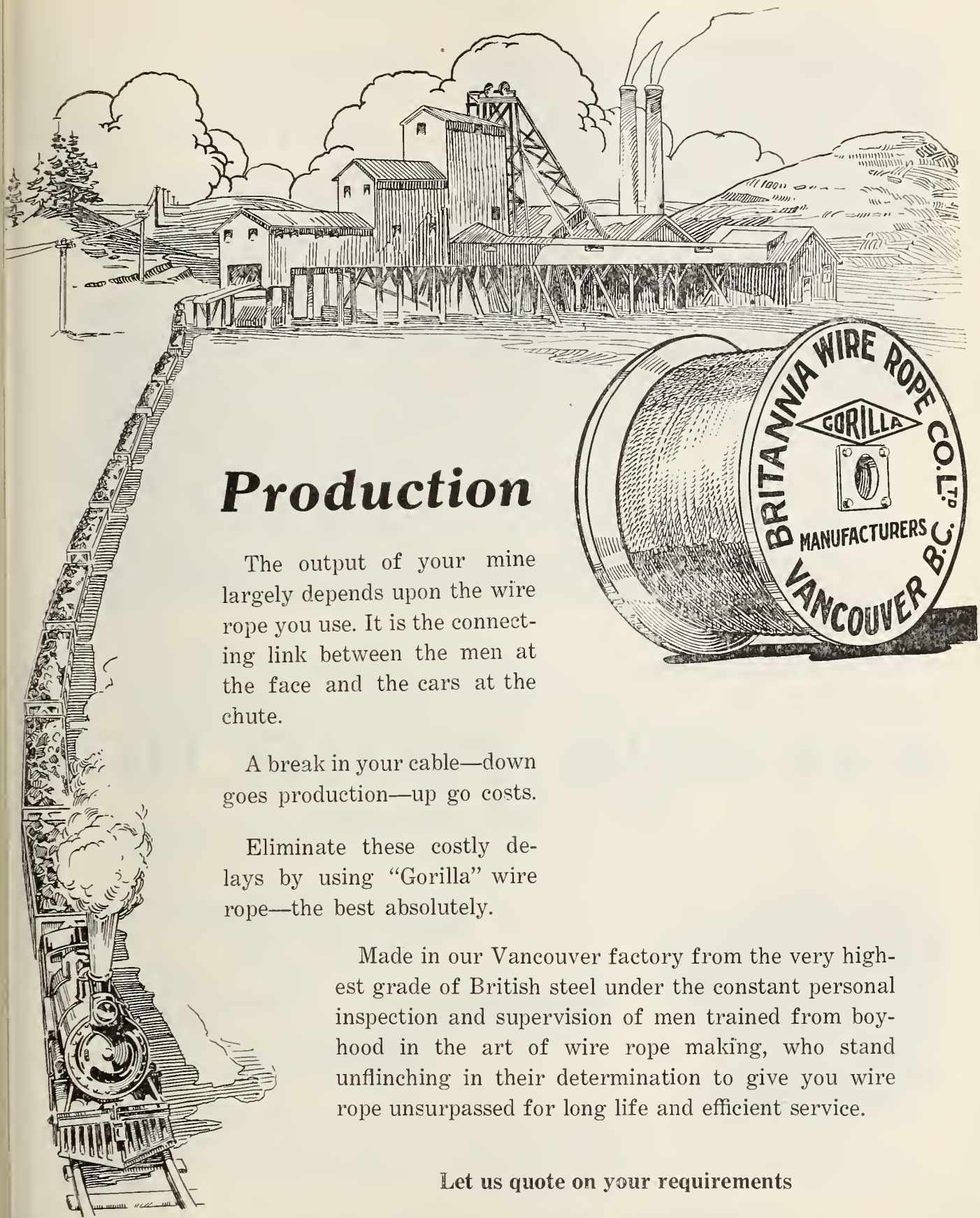
1. High efficiency and capacity constantly maintained.
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4. Wearing parts made of our special iron.
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11. Delivers a continuous, uniform stream.
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14. Requires practically no attention.

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N. B. Yes, we build the famous Marcy Mills—want literature?



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The output of your mine largely depends upon the wire rope you use. It is the connecting link between the men at the face and the cars at the chute.

A break in your cable—down goes production—up go costs.

Eliminate these costly delays by using "Gorilla" wire rope—the best absolutely.

Made in our Vancouver factory from the very highest grade of British steel under the constant personal inspection and supervision of men trained from boyhood in the art of wire rope making, who stand unflinching in their determination to give you wire rope unsurpassed for long life and efficient service.

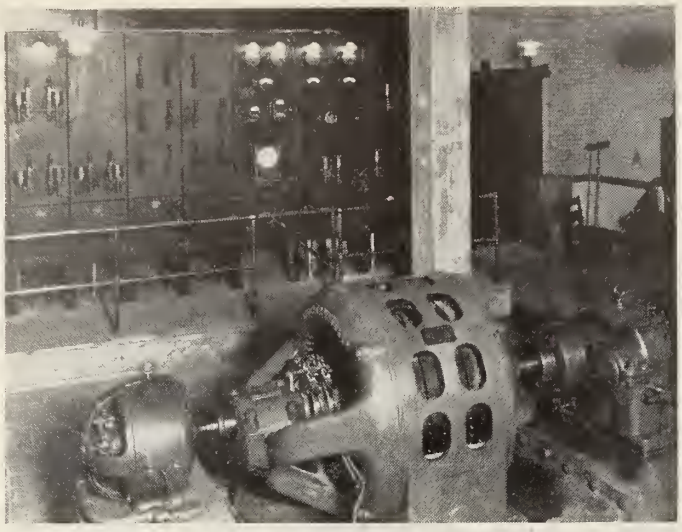
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VANCOUVER B.C.

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FACTORY:
Granville Island

Telephone,
Seymour 8151
Private Exchange
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In background—Main Switchboard of Riverdale Technical School, supplied by Monarch Electric Co.

MONARCH SWITCHBOARDS

are in demand for the most modern Schools and Public Buildings.

Among some of the most up-to-date institutions in the Province of Ontario in which they are to be found is the New Riverdale Technical School, Toronto.

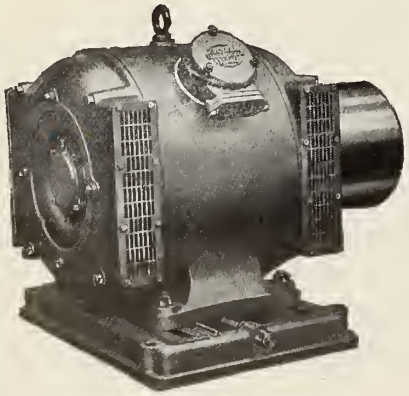
Monarch Electric Company Limited

Montreal **Toronto**

MAXIMUM PROTECTION

FOR YOUR MOTORS

CAN BE OBTAINED BY USING



"Lancashire latest type Enclosed-Ventilated, Ball and Roller Bearing Motor

Lancashire

LATEST TYPE

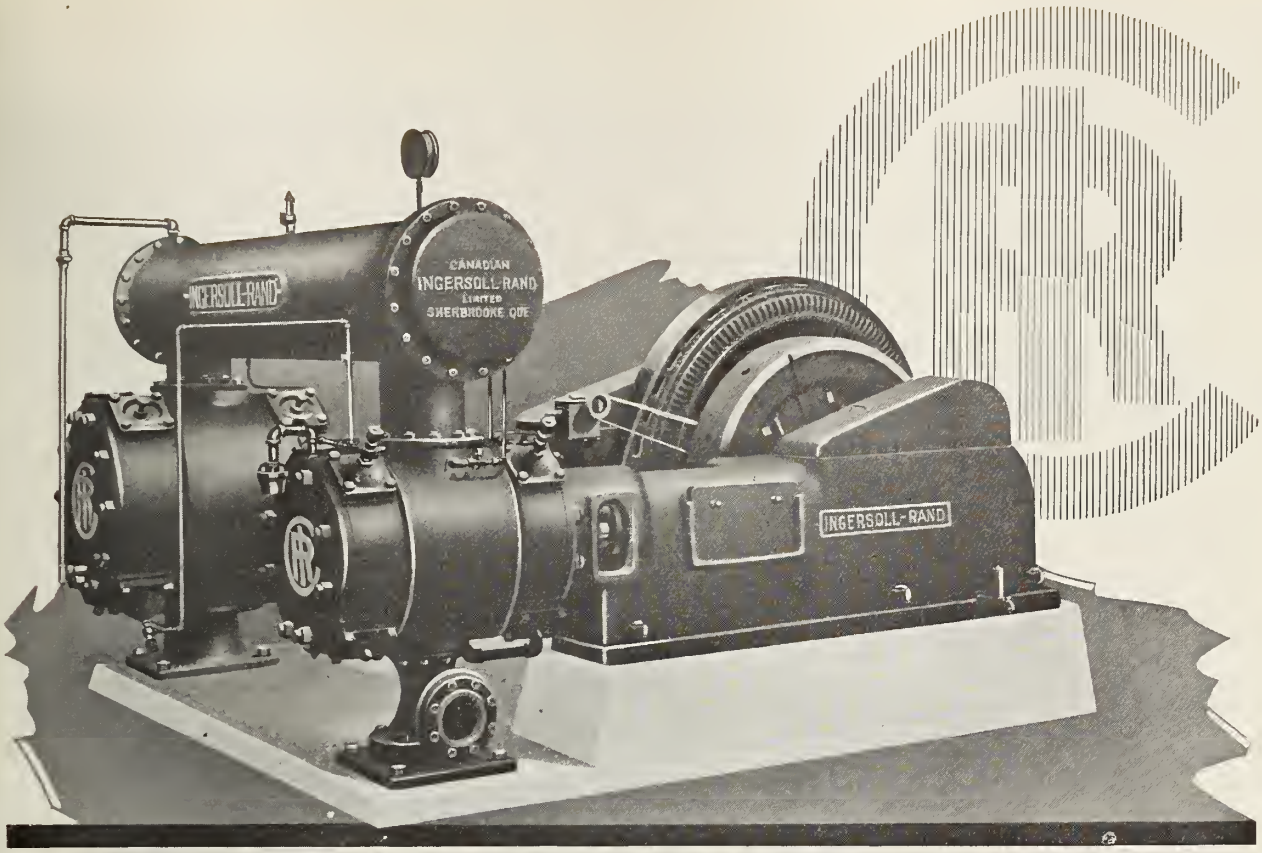
Enclosed - Ventilated Motors

Can be quickly changed to Drip-proof or Pipe Ventilated by simply changing or removing the expanded metal covers on the openings.

LANCASHIRE DYNAMO & MOTOR CO.

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VANCOUVER TORONTO MONTREAL



What is the Average Load on Your Compressor?

Only unusual conditions require the same air output at all times during the day or year.

A compressor operates at highest efficiency at full load, but full load is hardly ever the average load.

The best way to secure maximum compressor efficiency is to install a compressor which will operate automatically and efficiently at partial loads.

The 3-Step Free Air Unloaders now furnished on the smaller Class PRE Direct-Connected Motor Driven and PRB Belt-Driven Compressors, permits efficient operation at full, half or no loads. Larger units are equipped with 5-Step Automatic Clearance Control providing for efficient operations of full, three-quarter, one-half, one-quarter and no loads. Both methods of regulation are entirely automatic and do not disturb running balance or cause surges in the power lines.

Other features include Ingersoll-Rand plate valves, enclosed construction and automatic lubrication. Let us send you bulletins describing these units.

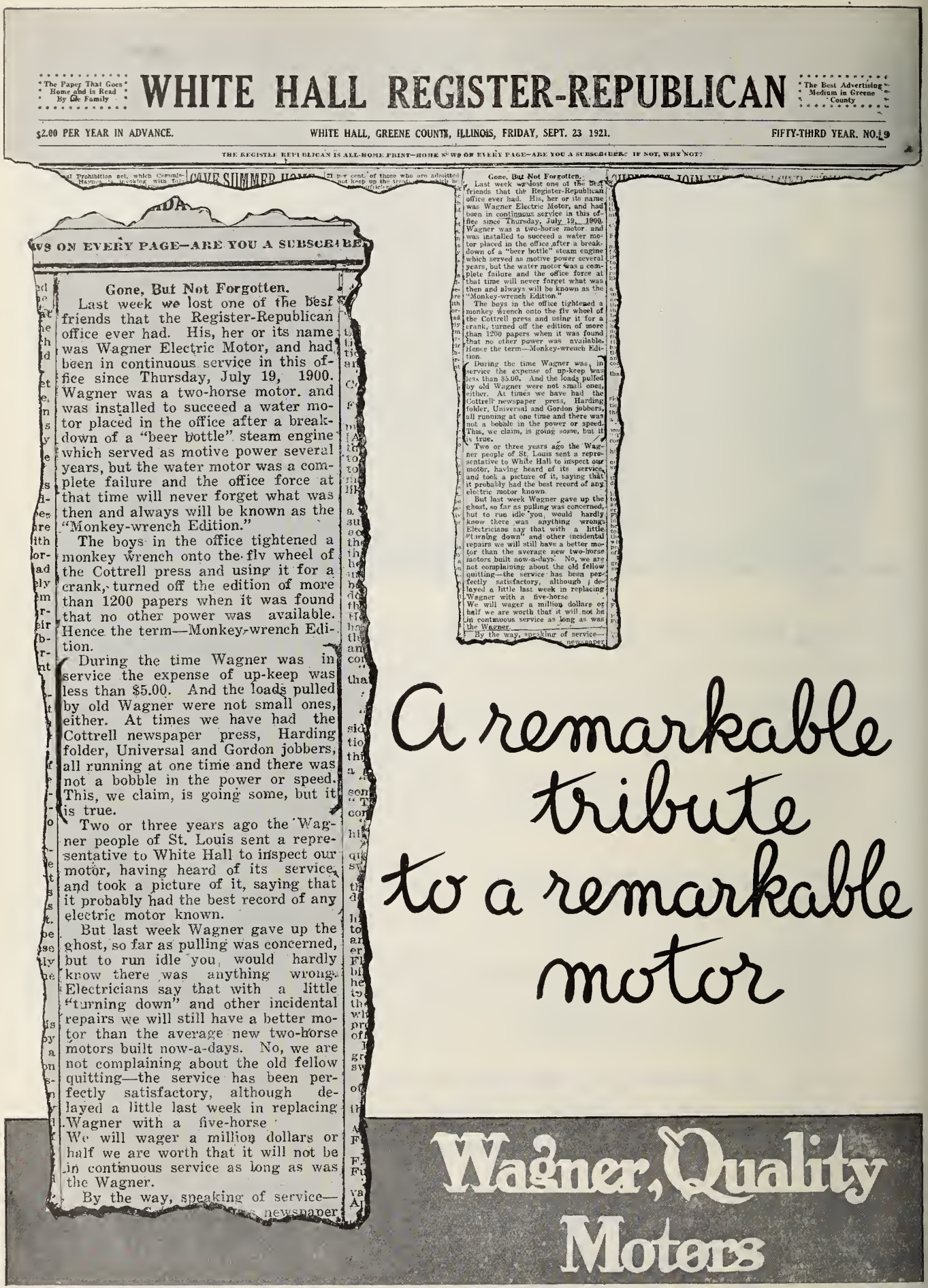
Canadian Ingersoll-Rand Company, Limited

Sydney Sherbrooke Montreal Toronto Cobalt
Winnipeg Nelson Vancouver

For the U. S. refer Ingersoll-Rand Co., 11 Broadway, New York

Ingersoll-Rand

Pumps, Compressors, Air, Steam and Electric Hoists, Oil Engines



The Paper That Goes Home and is Read By the Family

WHITE HALL REGISTER-REPUBLICAN

The Best Advertising Medium in Greene County

$2.00 PER YEAR IN ADVANCE. WHITE HALL, GREENE COUNTY, ILLINOIS, FRIDAY, SEPT. 23 1921. FIFTY-THIRD YEAR. NO. 19

THE REGISTER-REPUBLICAN IS ALL-HOME-PRINT—HOME NEWS ON EVERY PAGE—ARE YOU A SUBSCRIBER? IF NOT, WHY NOT?

Gone, But Not Forgotten.

Last week we lost one of the best friends that the Register-Republican office ever had. His, her or its name was Wagner Electric Motor, and had been in continuous service in this office since Thursday, July 19, 1900. Wagner was a two-horse motor. and was installed to succeed a water motor placed in the office after a breakdown of a "beer bottle" steam engine which served as motive power several years, but the water motor was a complete failure and the office force at that time will never forget what was then and always will be known as the "Monkey-wrench Edition."

The boys in the office tightened a monkey wrench onto the fly wheel of the Cottrell press and using it for a crank, turned off the edition of more than 1200 papers when it was found that no other power was available. Hence the term—Monkey-wrench Edition.

During the time Wagner was in service the expense of up-keep was less than $5.00. And the loads pulled by old Wagner were not small ones, either. At times we have had the Cottrell newspaper press, Harding folder, Universal and Gordon jobbers, all running at one time and there was not a bobble in the power or speed. This, we claim, is going some, but it is true.

Two or three years ago the Wagner people of St. Louis sent a representative to White Hall to inspect our motor, having heard of its service, and took a picture of it, saying that it probably had the best record of any electric motor known.

But last week Wagner gave up the ghost, so far as pulling was concerned, but to run idle you would hardly know there was anything wrong. Electricians say that with a little "turning down" and other incidental repairs we will still have a better motor than the average new two-horse motors built now-a-days. No, we are not complaining about the old fellow quitting—the service has been perfectly satisfactory, although delayed a little last week in replacing Wagner with a five-horse

We will wager a million dollars or half we are worth that it will not be in continuous service as long as was the Wagner.

By the way, speaking of service—

newspaper

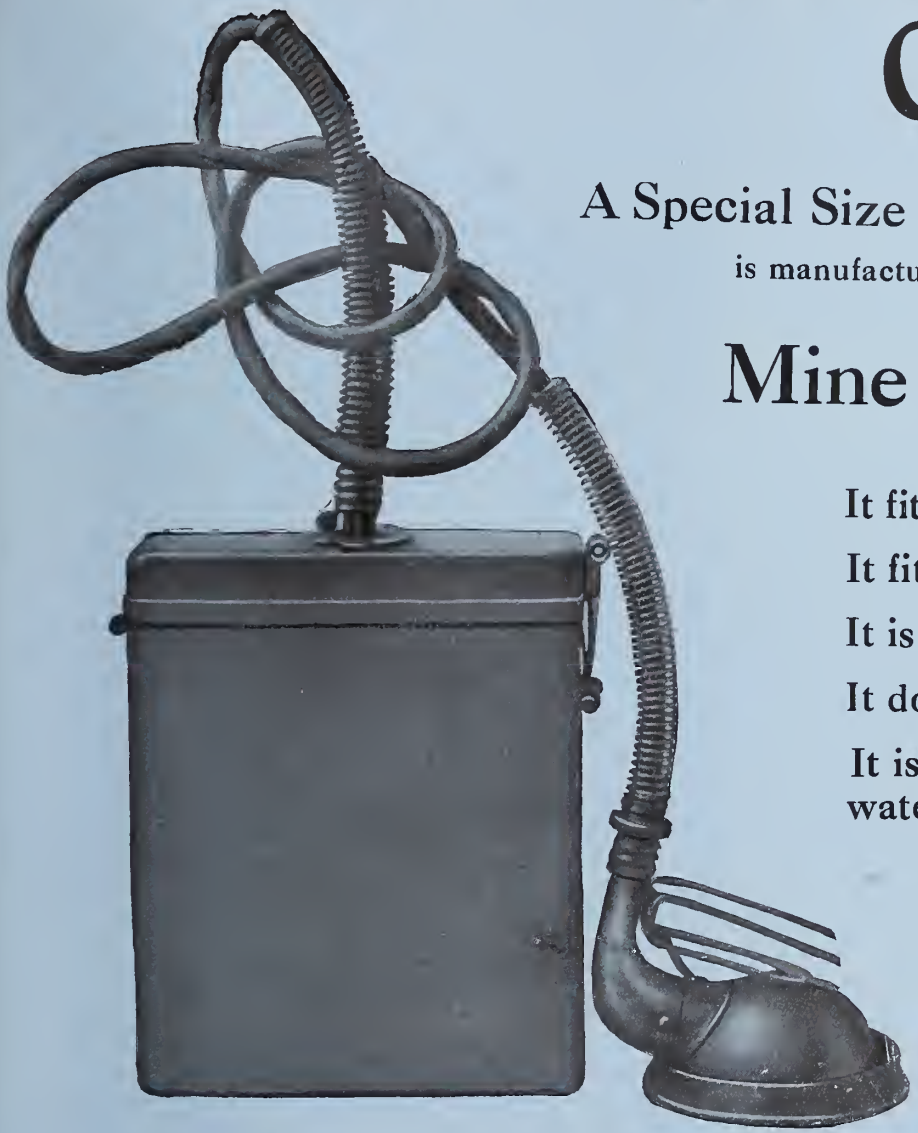
A remarkable tribute to a remarkable motor

Wagner Quality Motors

WAGNER ELECTRIC MANUFACTURING CO. of CANADA, LTD.

Power Bldg., Montreal 217 Dundas St., E., Toronto

CAB TIRE CABLE



Edison Mine Lamp equipped with Cab Tire Cable

A Special Size of Cab Tire Cable

is manufactured for use with

Mine Lamps

It fits the lamp.

It fits the battery.

It is extra flexible.

It does not kink.

It is not affected by oil, water, acids or alkalis.

It is not affected by temperature

IT LASTS

Manufactured in Canada by

Northern Electric Company

LIMITED

MONTREAL	TORONTO	WINDSOR	CALGARY
HALIFAX	HAMILTON	WINNIPEG	EDMONTON
QUEBEC	LONDON	REGINA	VANCOUVER

"Makers of the Nation's Telephones"

MANUFACTURING

Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and receiving Equipment

DISTRIBUTING

Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

IT'S A GREAT DETECTOR

as well as an

AMPLIFIER



The Famous

Northern Electric

R215A

Peanut Tube

The Peanut Tube is rugged. Originally designed for Radio use in airplanes, it needs no cushion support.

Operating on a single dry cell battery, its life of 2000 hours means real economy.

For bringing in distant stations it has no equal.

Tell your radio customers these facts and get more business.

DEMAND YOUR SUPPLY

AND

SUPPLY YOUR DEMAND

Manufactured in Canada by

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MONTREAL TORONTO WINDSOR CALGARY
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"Makers of the Nation's Telephones"

MANUFACTURING

Manual Telephones
Automatic Telephones
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Radio Sending and receiving Equipment

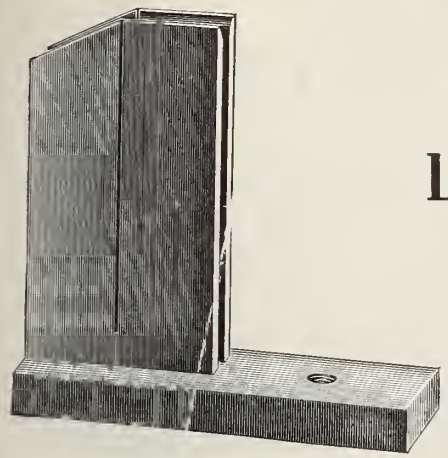
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Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

Dealers apply to nearest branch house for prices and discounts

Use "Canadian Made" Not "Canadian Assembled"—"Keep Your Money in Canada"

Milled Type

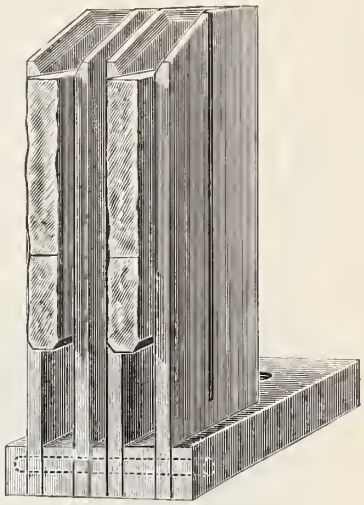


200-400 Amps

Manufacturers of

Lighting Cabinets
Service Boxes
Cutout Boxes
Pull Boxes

Milled Type



600 Amp. and over

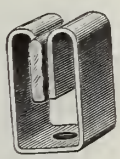
SPECIAL STEEL CABINETS with Knife Switches and Outside Control for Power and Heavy Duty Lighting Panels

Switches of 200 Ampere capacity and over are made with Milled Type Break Jaws and Fuse Clips, the same type as used on all high class work such as Power Switch Boards. This type of jaw insures proper contact for heavy loads.

Switches of 100 Ampere capacity and under are made with Punch Clip or Formed Type Break Jaws and Fuse Clips. Same type as used by some of our competitors for all switches. This type of jaw and clip do not give proper contact for loads of 200 Ampere and over and frequently break down under their rated load.

DISTRIBUTING BOARDS for Apartment Houses and Office Buildings

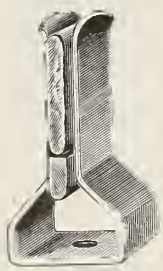
Formed Type



30-60 Amps.

STEEL BOXES & CABINETS
FOR
ALL ELECTRIC INSTALLATIONS

Formed Type



100 Amp.

All our Switches are equipped with heavy one-piece Fibre Knife Blade Cross Bars which are strong both mechanically and electrically

Canadian Drill & Electric Box Co., Limited

1402 Queen St. East, Toronto, Ontario

COUCH
TELEPHONE SYSTEMS

This is Couch B-12 System—Selective Talking—Selective Ringing. Any station may call any other by pressing the proper button and only the desired station will ring. The operation of calling, automatically connects for talking, so that when the receiver is removed from the called station, conversation may proceed.

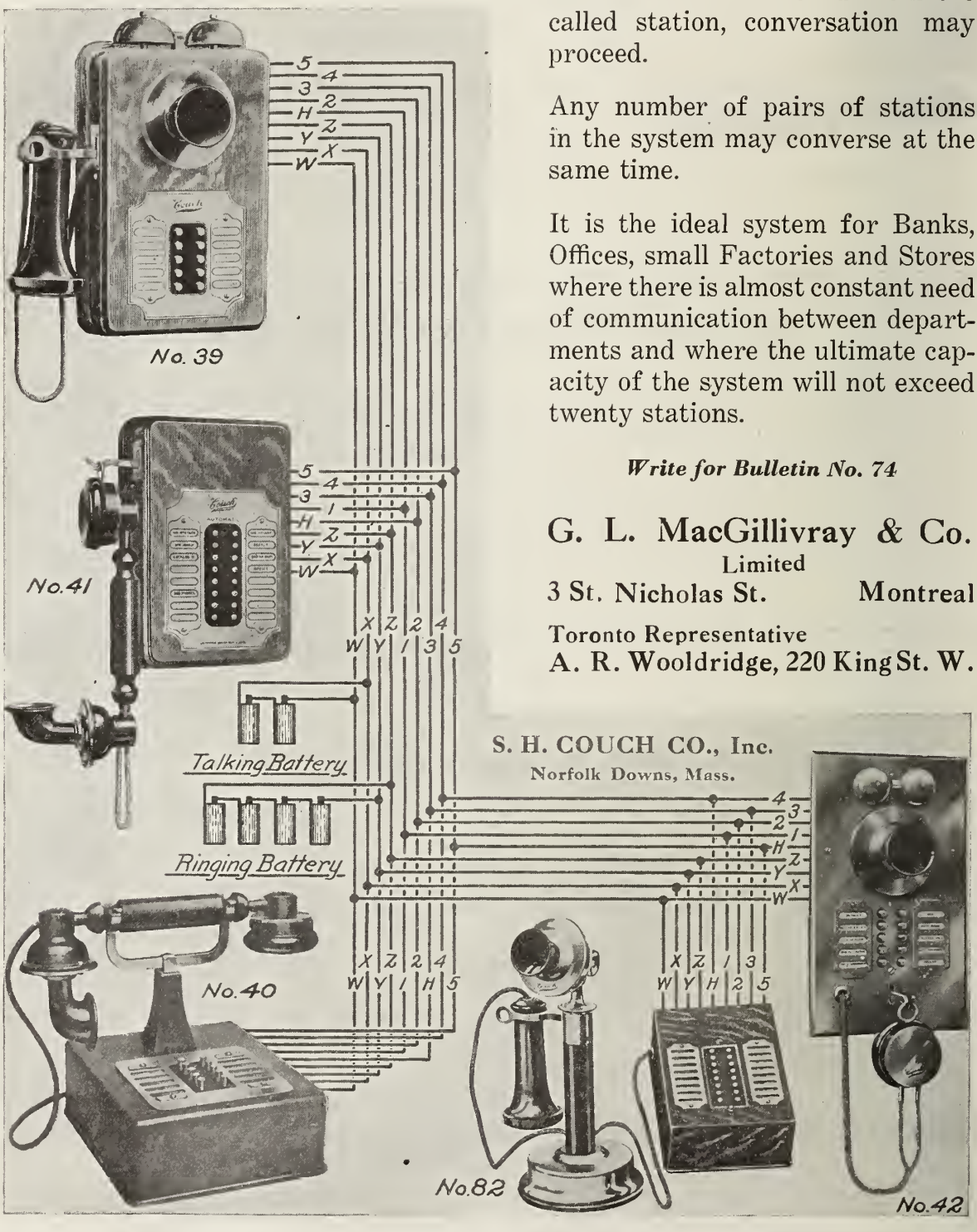
Any number of pairs of stations in the system may converse at the same time.

It is the ideal system for Banks, Offices, small Factories and Stores where there is almost constant need of communication between departments and where the ultimate capacity of the system will not exceed twenty stations.

Write for Bulletin No. 74

G. L. MacGillivray & Co.
Limited
3 St. Nicholas St. Montreal

Toronto Representative
A. R. Wooldridge, 220 King St. W.



Electrical Engineering Contracting News Merchandising Transportation

For over thirty years the recognized journal for the Electrical Interests of Canada

Hugh C. MacLean Publications Limited

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Member Business Newspapers Association of Canada

Vol. 32 November 15, 1923 No. 22

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PUBLISHING HOUSE OF HUGH C. MACLEAN



Midgets in size—but giants in power

IMAGINE a radio storage battery so light that you can lift it on the palm of your hand, but powerful enough to supply all the current you need for long-distance receiving—and then some!

The new two-and-four-volt Exide A Batteries for low-voltage tubes weigh only five and six pounds each. And they are wizards of efficiency—right in step with the latest developments in radio receiving.

These sturdy little batteries are neat and compact. They were specially designed for WD-11 and UV-199 vacuum tubes, but can be used with any low-voltage tube. The two-volt Exide A Battery consists of a single cell. It will heat the filament of a quarter-ampere tube for approximately 96 hours. The four-volt A Battery, having two cells, will light the filament of a 60 milli-ampere tube for 200 hours.



For six-volt tubes

Like all Exide Storage Batteries, the Exide A Battery for six-volt tubes is dependable and long-lasting. It is made in four sizes, of 25, 50, 100, and 150 ampere hour capacities.

Service you will appreciate

Exide Radio Batteries are carefully constructed on sound engineering principles. They give the kind of service every radio fan would like to get from his storage battery.

As you know, any variation of current in the plate circuit produces weird sounds in your phones. With an Exide B Battery hooked up to your set, static is the only interference you will have to contend with. The Exide B Battery supplies steady, noiseless current. It permits the niceties of adjustment that make radio receiving an unalloyed pleasure.

The Exide A Battery for six-volt tubes has extra-heavy plates, assuring constant potential and uniform current over a long period of discharge. Like all Exide Batteries it embodies the finest materials available.

In marine and commercial wireless

On sea and on land the Exide plays an important role in the industrial life of the nation. In marine wireless Exide Batteries provide an indispensable store of emergency current. A majority of all government and commercial wireless plants are equipped with Exides.



Exide B Batteries

give noiseless, full-powered service over a long period of discharge. Designed throughout to prevent electrical leakage. Capacity, 3 ampere hours.

If you sell Radio Supplies you certainly should keep these Exide Radio Batteries in stock. Write us today for information—or ask your jobber to supply you.

Exide
RADIO BATTERIES

EXIDE BATTERIES OF CANADA, LIMITED

153 Dufferin Street — Toronto

ELECTRICAL NEWS

DEVOTED TO THE INTERESTS OF
A UNIFIED ELECTRICAL INDUSTRY

Vol. 32 | Toronto, November 15, 1923 | No. 22

This School Wiring Job is a "Model"

Riverdale Technical School Has Own Generating System in Addition to Hydro Supply—Provision for Experimental Use of Electricity— Electric Ranges for Cooking Demonstrations

A unique and complete electrical generating and distributing sysem has recently been installed in the new Riverdale Technical School, Toronto, Ont., by the Canada Electric Co., Ltd.

The main power supply is from the Toronto Hydro-electric System lines, from which the service is brought underground into the building at a pressure of 550 volts. This incoming feeder terminates at a 1,200 amp. oil switch. From this switch the current is diverted to the power, as well as the lighting control switches. In each case the controls are of the three phase, 550 volt double throw type, operating either on Hydro or on current generated by the school's own plant. The entire power section of the main switchboard is equipped with duplicate control and the power can be so distributed between the school's own plant and the Hydro that it is possible to keep the peak load factor down to a minimum.

The switchboard is one of the most completely equipped in the city as it has arrangements for complete generator plant as well as transforming apparatus for all current used in the lighting system.

The transformers, which are three in number are all 25 kv.a., 550 volt, 25 cycle, 3 phase, with balanced neutral and were made by the Packard Electric Company. A special transformer vault has been built to plans which embodies the latest ideas in this type of construction.

Motor switch controls throughout the building are of Krantz (Nesbitt Elec. Co.) type W.K. 100, having overload and no-voltage release. This equipment is the latest idea as a means of protecting small motor equipment against excessive starting currents. The switches are equipped with thermal release which allow for normal starting current and have a time limit, which under an over-load, immediately releases the main switch. The power distribution panels are of Krantz auto-lock, brush switch type, and can be locked in an off position and arranged in such a manner that is impossible to get at fuses unless the auto-lock switch is in off position, when operator cannot come in contact with any live parts.

Signal System

The current for a signal system is provided from a motor-generator set and charging switchboard in



Riverdale Technical School, Toronto

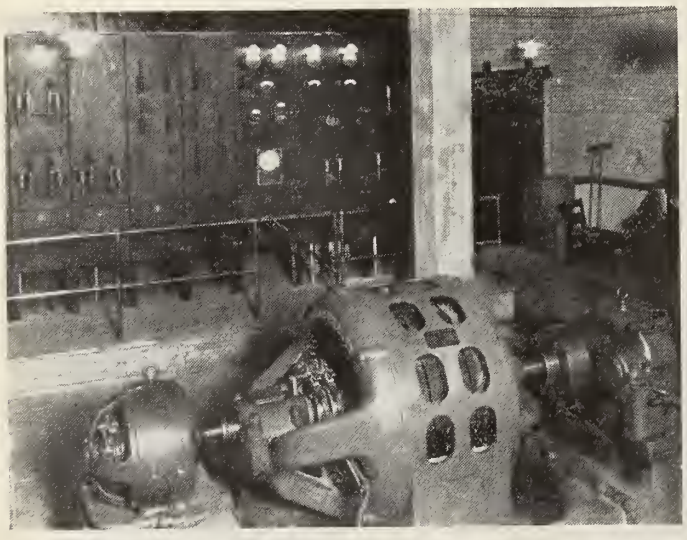
fan room. This is of sufficient capacity to provide for the entire number of gongs in building, even if operated simultaneously. A complete system of master and secondary clocks with program time clock system as well as fire alarm break stations with annunciator, is provided in principal's office. The motor-



A corner of the machine shop, showing motor drive and control. Lighting unit is typical

generator used in connection with this system was made by the Robbins & Myers Company. Charging board was produced by the Monarch Electric Company, Montreal.

In the special kitchen which has been put in for domestic science work, there have been provided special heating outlets equipped with control switch and pilot lamps for each student. The physics labora-



Main switchboard and motor generator set

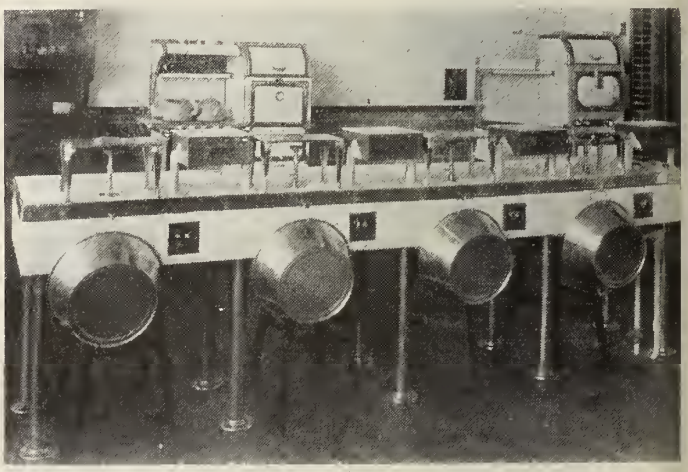
tories are provided with tables which have in connection B. & M condulets with polarity type receptacles. This type was especially designed some fe wyears ago for Harbord Technical School and since that time has become standard equipment for this kind of school work.

Electricity in Class Rooms

The science rooms are equipped with special switchboard and generator equipment which is very complete, providing direct current at voltages 6 to 32 and from 30 to 110. This board is arranged in such a manner that the the various panels automatically show at a glance from red and green bull's eyes whether current supplying same is low or high voltage. Above each panel there is provided a direct current volt meter registering potentials of current supplied. A large duplex motor-generator set, of the Lincoln Electric Company manufacture, is provided for this board, furnishing current at 550 volts, 3 phase. One end of the set generates a current of 100 amp. at 115 volts, the other end supplies 100 amp. at 32 volts. This equipment is inter-connected in such a manner that any panel can be furnished with a range of voltage to 125 volts direct current.

Stage Lighting

Among other interesting feaures of the installation may be mentioned the stage lighting. This is part of the auditorium equipment and is made up of foot-lights and stage pockets with arrangements for



A domestic science classroom, showing electric range, hot-plates, and special heating outlets

border lights if later desired. Provision is also made in the auditorium for standard motion picture machines, as well as stereopticon machines.

It is not too much to state that the wiring and equipment of this school represent a very high standard and, in fact, it may be said to be one of the best equipped schools of the kind in this country.

Our Immense Mining Resources

In another part of this issue will be found several articles that show how great an asset to Canada is the mining industry. Read the story and see how electricity plays a part.



When Is a Profit Not a Profit?

Clear Answer to a Question That Vitally Concerns Every Seller of Electrical Merchandise

By C. D. HENDERSON
President, Henderson Business Service, Brantford

I don't suppose there is a word in the language of business so little understood and yet so much cussed and discussed as the word PROFIT. The general public considers it synonymous with profiteering, wealth and the cause of most of the world's economic ills. The average electrical dealer in his wild desire to get work away from his competitor thinks just as little of it as possible trusting that by some act of Providence it will be taken care of. Only when he awakens to the fact that he is facing Bankruptcy does he appreciate its significance.

In plain English, PROFIT is what is left after all costs have been paid and costs include material, labor, salaries, rent, light, heat, taxes, stamps and all other items of fixed charges or overhead expense. Any such item omitted from the cost will simply reduce the profit by just its amount or worst still turn a supposed profit into an actual loss.

Suppose I am an electrical dealer and my last year's volume was $30,000. My fixed charges were, say, $7,500. This means that out of every dollar I took in, 25 cents had to go to pay overhead, so that the cost of running my business was 25%. If I desider a profit (and a real one at that) say of 10%, this would take another 10 cents from my dollar so that I would be left with 65 cents to pay for labor and material. Alright—what's next?—Just this: I know that if I buy an article at 65 cents, I have got to sell it at $1.00 in order to pay overhead expense and make a net profit of 10%. In other words in order to get my selling price on this 65 cent article, I must add 54% to it.

Now here is the old error:—I might carry in my mind that I need a margin of 35% (25% overhead and 10% profit) and without thinking add this 35% to my first cost of 65 cents with the result that I get a selling price of 87¾ cents and instead of making a net profit of 10 cents, as I looked for, I have an actual loss of 2¾ cents. One of the best illustrations I can think of in support of the principle of figuring the margin of the selling price is a case which came to my attention some time ago. Here are the details:

A friend of mine wanted to sell his horse which had cost him $50.00. He asked a jockey to try and dispose of it. The jockey agreed to on a basis of 33 1/3 commission. Desiring to make a profit himself, my friend, mentally figuring, placed the price of the horse at $75.00 as this would be a profit of 50% and the jockey asking 33 1/3 commission, it would leave him 16 2/3%. So far, so good. The jockey sells the horse and makes settlement as follows:—

Sold one horse	$75.00
Less commission 33 1/3	25.00
Balance check enclosed	$50.00

Now the jockey was right. He offered to sell the horse for 33 1/3% commission and the selling price was set by my friend, not by the jockey.

The object of this illustration is not to prove that there is only one correct way of figuring percentages and that is on the selling price, but it does show very forcibly the importance when using discounts or percentages to start out with a clear understanding as to whether the figures are based on COST or SELLING PRICE.

It is perfectly proper when figuring your selling price to add overhead and profit to your cost price but never under any circumstances use the same percentages which are based on selling price. For instance 35% (Overhead 25% and profit 10%) on selling price is 54% on your cost.

Moral

If you prefer adding a percentage to your cost to get your selling price find out what percentage ON THE COST it represents. The following table may be of some help.

Margin on Cost and Selling Price

4¾%	on	selling	price	is	5	%	on	cost
9	%	"	"	"	"	10	%	"	"
13	%	"	"	"	"	15	%	"	"
20	%	"	"	"	"	25	%	"	"
23	%	"	"	"	"	30	%	"	"
25	%	"	"	"	"	33⅓	%	"	"
28½	%	"	"	"	"	40	%	"	"
31	%	"	"	"	"	45	%	"	"
33⅓	%	"	"	"	"	50	%	"	"
35	%	"	"	"	"	54	%	"	"
37½	%	"	"	"	"	60	%	"	"
40	%	"	"	"	"	66⅔	%	"	"
44½	%	"	"	"	"	80	%	"	"
47½	%	"	"	"	"	90	%	"	"
50	%	"	"	"	"100	%	"	"	

When Selling Parts Educate Customers

They Are the Big Buyers of the Future

By a Radio Salesman

A large part of this business is selling parts to amateurs for odd sets. This is our preliminary contact in a great many cases and it may be used advantageously to work for more business. Educate customers in the art of radio. Nine out of ten of them, or perhaps 99 out of a hundred will bring in books with diagrams and they don't even know the name of the apparatus which the diagrams represent, hence there comes an important opportunity for the radio salesman to educate his customer in the art of radio, and at the same time winning his confidence, which ultimately means greatly increased business. They come back if they are treated decently and such policy pays.

Another point I find about most people who buy radio, is that they feel they are dealing with an unknown quantity when they purchase a radio set and they are naturally extremely cautious. Hence it helps greatly if you tell your customer, that you will change his set for him if there is anything wrong about it or that he does not like. Of course there must be a reasonable time limit to all such transactions. Another point is that the stuff must be left around so that they can handle it. This business of putting up signs saying "Please don't touch" or "Kindly leave alone" is, to my mind, bad business. These radio fans want to handle the stuff and while they are doing so they are selling themselves. The damage they do is never serious. I believe that for an established man, show cases and display racks of the best design are a desirable investment. Then what the fan doesn't see on the counter, is there in the show case and that is what sells.

My idea of the prospects for business is that it will be greatly improved this year. People are buying a better class of material. There is no junk stuff on the market and there are a lot of people going into the market who previously stayed out because they thought that new developments in the radio world would make obsolete all the sets at present on the market. The fact that there have been no radical changes in the design of sets for the past year has convinced these people that a radio set is a safe investment. In fact, this same idea has been worrying many radio dealers and so far as I can tell there is no excuse for such worry.

The basis of doing successful radio business is confidence. Educate your customers, let them know that the goods will be accepted back by the store if they don't prove satisfactory and don't misrepresent your goods.

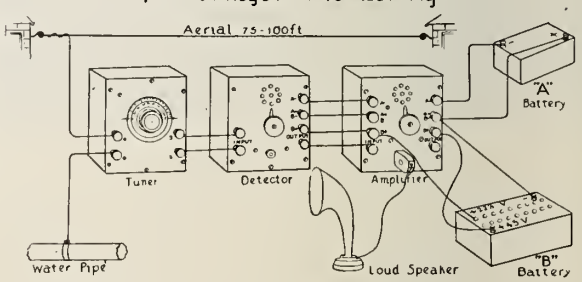
"How Far Will it Receive"?

By a Radio Salesman

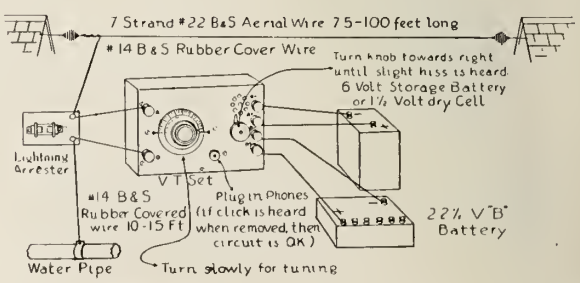
A feature of radio business is the "desire for distance." The first question that many people ask is, "How far will this set receive?" Obviously it is a question that cannot be answered directly. The receiving qualities of a set depends so much upon the strength of the broadcasting station, the skill of the operator and unpredictable local conditions, that it is impossible to give a definite answer. The way to handle such questions is to explain that radio sets are divided into three classes (1) crystal (2) non-regenerative (3) regenerative circuits.. Now we know, of course that the first type of set will receive only a nearby station unless under very exceptional conditions. Classification number 2 will receive most high power broadcasting stations and of course number 3 will go pretty well over the continent under normal conditions. This morning I got a letter saying "How far will your $30.00 set reach?" Of course, that is an impossible question but I wrote back to this inquirer that it was impossible to state in miles just how far the set would receive. I then went on and explained that if anybody else sold him a set and guaranteed a definite mileage they were doing nothing less than misrepresenting the goods. Then I explained about sets in general, as outlined above.

Diagrams That Will Interest Your Young Customers

Simple Non-Regenerative Receiving Set



Single Vacuum Tube Receiving Set





Christmas Poster 20′ x 9′ for 30 Billboards for Toronto

A Vigorous Campaign for the Christmas Trade

Electrical Appliances as Gifts

This Slogan to be Drilled Into the Minds of Toronto Citizens by Large Posters, Attractive Window Displays, Placards and Other Advertising

The Electric Service League of Toronto has arranged a quite extensive and somewhat novel Christmas campaign. The keynote of Christmas, for the electrical trade, is "Sell appliances as gifts" and the publicity and service given by the League carry out this idea thoroughly. Its main features may be summarized as follows:

1. Display of handsome Christmas poster on 30 billboards in various sections of Toronto from November 25 to December 25. A one-color reproduction of the poster is herewith presented. The wording at the bottom "Watch Dealers' Windows for Suggestions" ties in the idea of "Give Something Electrical" for the dealer. The posters will measure 20 ft. by 9 ft.

.2 Free window dressing for Toronto dealers. The League is paying the cost of a special Christmas window display. The windows will be dressed, any time after December 1, as the dealers request. The "electrical gift" idea will be the message of each window.

3. Cotton placards about 3 feet long will be printed with the words "Give Something Electrical" and will be displayed on wholesale and retail delivery wagons and trucks.

4. Electrical newspaper advertising. The League will offer to supply suitable reading matter to the newspapers for a weekly electrical page or section, and do what it can to help create supporting advertising.

5. League advertising—If the appropriation for the Christmas campaign allows, the League will place advertisements in the newspapers.

The League campaign calls for the co-operation of every dealer in Toronto, and a meeting of the dealers to discuss the campaign, arrange for signatures for window-dressing, etc., has been arranged for mid-November. The window-dressing feature is a special co-operative measure not tried before in any large industry. It should not only improve the general tone of dealer window displays, but will lend a certain uniformity to them, embodying the central idea, and enable the tieing in of windows and billboards.

Some dealers may, of course, prefer to dress their own windows, with special lighting, or appliance features of their own. But the co-operative feature of the League window-dressing scheme has a value of its own, which the dealers will grasp when they see the billboards.

The Christmas campaign committee of the League consists of Mr. C. H. Hopper, chairman, Messrs. J. Herbert Hall, W. R. Ostrom, H. H. Rimmer, and A. W. J. Stewart, all of them directors of the League except Mr. Rimmer. This committee has planned to attend the mid-November meeting of the dealers, and help push the Christmas campaign.



How About Your Christmas Goods?

In This List Will be Found Suggestions for Every Gift Need —Electrical Novelties Draw Trade

Electric heating pad
Bell ringer
Bath heater
Cereal cooker
Casserole
Chafing dish
Clothes drier
Clothes washer
Coffee grinder
Coffee percolator
Combination cooker
Corn popper
Cream whipper
Dish washer
Drink mixer
Egg tester
Fan
Fireless cooker
Food warmer
Gas lighter
Griddle
Hand lamp
Hot plate
Ice cream freezer
Iron
Ironing machine
Lemon squeezer
Milk warmer
Plate warmer
Radiator
Waffle iron
Range or stove
Refrigerator
Regulating lamp
Sauce pan
Sewing machine motor
Sterilizer
Table cooking set
Table lamp
Tea ball pot
Tea wagon
Toaster
Toaster-stove
Vacuum cleaner
Traveler's stove
Bath cabinet
Bed lamp
Candle or night light
Deodorizer
Ceiling clock
Electrically heated blanket
Electrically heated cap
Foot warmer
Violet Ray apparatus
Water heater
Heating device
Heating pad
Medical battery
Medical coil
Milk bottle and food warmer
Motor chair
Nurse signal
Obesity apparatus
Sterilizer
Therapeutic lamp
Vibrator
Water kettles
Wired furnit. re
Air heater
Electric grate
Candlestick adapters
Perfume burners
Luminous pendants
Samovar
Hair dryer
Electric fireless cookers
Floor lamps
Battery lantern
Bed lamp
Burglar alarm
Candlestick
Chair lamp
Cigar lighter
Curling iron
Desk fan
Desk lamp
Electric fountain
Electric humidifier
Foot warmer
Hair drier
Hair waver
Heating pad
Hearing devices
Floor lamp
Lighted aquarium
Luminous switch plate
Massage vibrator
Lamp shades
Piano lamp
Portable radiant heater
Reading lamp
Reminder clock
Illuminated shaving mirror
Shaving water heater
Silk lamp shade
Traveler's iron

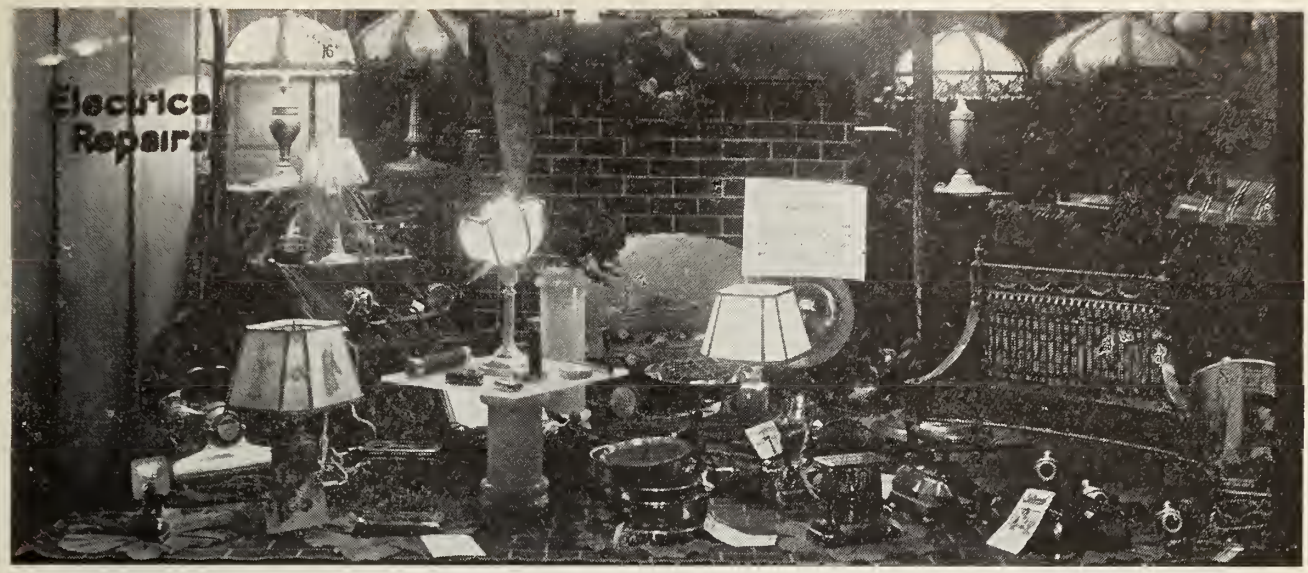
Radio, Toys, Automobile Accessories

Battery lamp
Foot warmer
Lamp kit
Signal bell
Signal lights
Trouble lamp
Cigar and pipe lighter
Electric horn
Electrically heated gloves
Garage portable lamp
Headlight dimmer
Inspection lamp and magnet
Limousine annunciator
Limousine cluster light
Limousine telephone
Pocket testing meter
Signal gloves
Steering wheel warmer
Spotlight
Vulcanizer
Loop aerials
Insulators
Amplifying transformers
Charging outfits
Crystal detectors
Phone condensers
Antenna wire
Dynamo
Electric boat
Electric engine
Electric range
Fan
Ferris wheel
Utility motor



—Courtesy S. E. D.

Electric locomotive
Telephone
Toy magneto
Electric train
Transformer
Trolley car
Motion picture machine
Shock coil
Battery
Battery lantern
Flashlight
Electric fountains
Bicycle light
Cance lamp
Battery fan
Horseshoe magnet
Telegraph instrument
Baby flatiron
Nursery light
Toy washing machine
Ground switches
Lour speakers
Rheostats
Head sets
Tuning coils
Vacuum tubes
Complete sets
Variocouplers



A window that brings out the "Give Electrically" Idea

Start Pushing Gift Sales Now!

Extra Attention at Present Will Spread the Peak Rush—Ideas That Will Bring Business

During the holiday season, even if business is good, don't forget that a weekly window change (or oftener) is a great tonic for business. One week's service will make the average window pretty dusty and that is about all the length of service you should expect from a single trim. The Electrical News has run across several dealers who make the practice of trimming the windows early on Friday morning. In most cases, the dealer doesn't do the actual work of the trim himself, but though he plans it and perhaps makes a rough diagram of the layout, he delegates the actual work of putting in the window to a junior member of the staff. There is no doubt that a window change boosts business.

Cumulative Decoration

Every year the advice "Start your Christmas Selling Early" is handed to the trade from many headquarters. The intention is good but a stumbling block to some dealers is the fact that they do not care to bump right into the full trouble of putting on Christmas decorations and window display early in the season. There can be no doubt that an early start is advisable but it is also true that it is liable to go stale, if started too early. The way to avoid this is to start at first with decorations in the interior of your store to a modified extent. This may be accomplished by putting in just a few simple festoons along the wall and perhaps red and green shades over some of the lamps. Have one small table with a pile of attractively wrapped Christmas packages and a card reading "Buy Your Electrical Christmas Gifts Now." Later on when the real rush starts, these decorations are available as a foundation upon which to build and perhaps you can change them or elaborate on them, and there is no suggestion of the display being stale.

Street Displays are Valuable

Wide awake dealers are finding that special effort concentrated on street displays at Christmas time is a profit bringer. It is true that in some communities there is legislation forbidding the use of lamp standards or telephone poles for the purpose, but in many cases it can be arranged. The idea is to attach to the poles along the street, signs indicating that you are making a specialty of electrical Christmas gifts. In some cases it is accomplished by several dealers in non-competitive lines joining together.

Cut Out Delivery Worries

Nearly everybody that buys gifts at Christmas time worries more or less about whether they will reach the recipient in time. Now, if you feel equal to the task of guaranteeing to your customers that anything they order will be delivered either on Christmas eve or Christmas day, you can make a considerable number of extra sales. The way to do it is to have a card announcing the fact, in your window or the interior of your store, and when purchase is made, hand to the customer a card certifying to the purchase and the promised delivery date.

Washers Sell in Small Town

There's a Market Wherever Women Use Rub-boards

Many dealers located in small towns believe the market for electric washing machines is dead because of the size of the town. That this idea is erroneous, is proved by the following account from A.B.C. of Selling, telling how one dealer in a small town gets after this business.

"Electric washing machines are a large part of our sales. We use good sized newspaper space in our paper each week. Second, we have several good women talking washers for us every day in our village. Third we have two very fine windows working for us day and night. Fourth, there are two of us talking washers to every possible customer that comes in the store. Fifth, we have washers all connected in the front of our store ready to start at a moment's notice and usually keep one running during the busy hours."

Washers Always Foremost

"You never can tell to whom you can sell a washing machine," said this dealer. "Very often you will sell a washer to the last person you would expect to buy."

"This has showed us that it pays to talk washing machines to every one regardless of whether you think they can buy or not.

"So we keep electric washers on our minds all the time and never let an opportunity pass by to tell someone of their superior qualities, and so on."

What Is Your State of Mind?

This example proves that just because a store is located in a village is no reason why washing machines should not be sold. Just keep on talking about them and someone is sure to buy.

Another point that this dealer makes is a good one. And that is that you never can tell who will buy. Sometimes the poorest looking prospect is the best customer. Any number of instances of this kind have been reported to us.

House to house canvassers should not pass up the poor looking home. The occupants may want a washing machine and you might be surprised to find that they had the money to pay for it.

Another Man's Washing Machine Experience

"Without one exception all my washing machine sales have developed for me another sale and they in turn, another and so on.

"This is how I do it. To every customer using one of my washers, who gives me the name and address of a prospect, and I close them, I make the old customer a present of an electric appliance of their own particular choice, up to a certain value.

"Herein lies the secret. A number of merchants have, I know, given money. If you give them money, they would be satisfied, but they would possibly spend it on something somewhere else. This way they get a toaster or a percolator and show it to their friends and tell them how easily they got it.

"This serves as an ad for your store and brings dozens of customers you would otherwise lose, and in several instances has resulted in sales of appliances you have given as premiums."

Laminated Phenolic Condensation Panel Material

There are properties which an insulating material for radio must have, for without these properties its efficient service will be short lived.

In some respects, hard rubber and one or two other materials are splendid for insulation. They have the necessary dielectric strength, and are impervious to moisture. But insulating materials for radio must have no tendency to warp, when exposed to heat or unusual cold. Neither should it be so brittle that it is likely to crack or split in the process of machining.

Think what it means to a man who has invested his money in a radio set, to find that the warping of the panel has thrown his dials out of alignment, interfered with their easy rolling movement, and disrupted the working adjustments of his set.

Laminated Phenolic Condensation products are known under various trade names as "Condensite Celoron," "Bakelite Dilecto," "Bakelite Micarta," "Formica," etc. These phenolic products are built up of a laminated structure consisting of paper or thin sheets of fibre especially treated with the phenolic gum. 25 or 30 of these sheets may be required to make an ordinary radio panel. The sheets are placed in a heavy hydraulic press between polished plates, and subjected to a pressure of almost one ton per square inch. At the same time, steam circulating around the plates heats the gum causing it to soften and flow, after which it hardens, forming a solid sheet.

Laminated phenolic products are tough and hard, have high dielectric strength, fine appearance, are chemically inert, insoluble, and infusible. Unlike hard rubber, it is practically unbreakable even when dropped on a stone floor. It is easily drilled, tapped, turned, sawed, or milled.

How Much Money in Mining Industry?

The answer is given by the Dominion Bureau of Statistics as $774,749,291, representing the par value of securities issued by Canadian Mining companies.

Fine Stores of Toronto Hydro-electric System







Lighting at Empire Exhibition

Thousands of tons of copper in the form of hundreds of miles of electric cable are now being buried in the grounds at Wembley, England. The task of lighting next year's great British Empire Exhibition is well under way. Evening being the most popular time for visiting exhibitions, great care is being devoted by the electrical engineers of the British Empire Exhibition to the illuminating of next year's show. A completely new scheme of artificial lighting has been devised, which will be put into effect by the use of all the most modern inventions known to electrical science.

Under Control of One Man

Vast as the Exhibition is, the whole of the lighting will be under the control of one man. He will have at his command electricity representing 5,000 horse power of mechanical energy, sufficient for the lighting of over half a million ordinary electric bulbs. This he will be able to regulate as a simple lamp. The power station which will supply the current will be of a size equal to that required for a city of 100,000 population. The general aim of the lighting section of the Exhibition is to produce a broad luminous effect, which will show up the buildings, emphasize the beauty of their structure and outlines and, in addition, harmonize with the changes of temperature. This will be achieved by an elaborate scheme of colour lighting. On a cold night the whole Exhibition will radiate under a warm orange or red glow. On hot, close evenings the lighting will change to a cool, moonlight effect. With a touch of the hand, the controller of the lighting, necessarily a man of artistic taste, will be able to change the color of the whole Exhibition, either in one flash or in successive waves of colour.

Beam of Light 200 Feet Square

Perhaps the most wonderful of all the lighting schemes in the Exhibition will be that employed in connection with the ornamental lake, which stretches from East to West across the centre of the main Exhibition grounds. The only lighting on the lake will be from four floating boats, which will shoot forth powerful beams of coloured light below and along the water's surface. The beams of light below the water's surface will be caught by mirrors on the bed of the lake and reflected upwards at various angles. At night a certain amount of mist always arises from a large expanse of water. Full advantage will be taken of this mist, and the various beams of light passing through it will give the illusion of an incandescent lake on which visitors may float in various weird craft, typical of those used in different parts of the Empire. The sky will also be used to show up the effect of powerful beams of light, and everyone within a distance of forty miles will know that the British Empire Exhibition is open. This will be effected by a perpendicular beam of light 200 feet square, many times greater in intensity than all the searchlights which were used during air raids on London put together, which will be sent up into the heavens from the electrical section of the Palace of Engineering.—Electrical Times.



The Lamp Tank

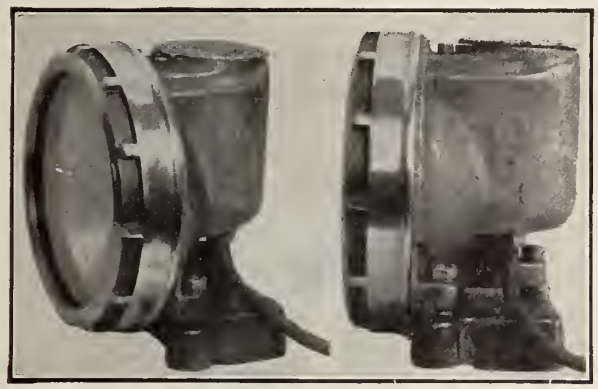
Lamp Tank Advertising

The accompanying illustration shows a Mazda lamp tank recently completed for the Waverly plant of the Edison Lamp Works by the Chicago Bridge & Iron Works Company, Chicago. A structural feature of the design which is of interest is the method of resisting the horizontal stress at the point where the inclined posts connect to the tank. On the regular tanks the balcony girder performs that function. On this particular tank the girder was omitted for obvious reasons and some struts were put inside of the tank between the columns to take the stress.

The Latest Developments in Electrical Equipment

Incandescent Headlight for Mine Service

The Jeffrey Manufacturing Company have placed on the market a headlight for mine locomotives, with several distinctive features. The main body of the lamp is shaped to cause heavy blows to glance off. The headlight is mounted on a sub-base with a three point double spring suspension. The parabolic reflector is made of brass, nickelplated, and highly polished, to insure a long beam of brilliant light. The lens, which is a 3/4 in. thick plate glass ,is held in place in a cast brass ring, by a nut and heavy packing. The



ring with its lens is screwed on to the main body of the lamp. In the top of the lamp is a hand hole which is closed by a large plug. Through this hand hole the focus of the lamps can be adjusted. One of the novel features of this lamp is the use of two standard sockets, one to receive the concentrated filament lamp which is a 94-watt 110-V connected two in series with a balancing resistance for 250 or 500 volts. The second socket takes the ordinary lamp used about the mine. The lamps in this socket are used only in case of emergency should the concentrated filament lamp not be available.

Cylinder Bellows

T. Peiffer, has placed on the market a cylinder bellows made of composition fiber with wood mountings for use in cleaning out electrical machinery. The



manufacturer states that it will not short circuit and that a strong air pressure will remove the dust from inaccessible places. It is made in four sizes, 20 in., 22⅜ in., 24¾ in., and 25⅛ in.

Star- Rite Electric Heating Pad.

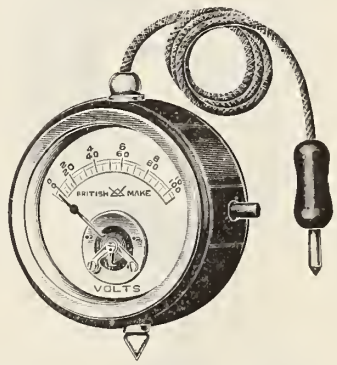
The Canadian Fitzgerald Manufacturing Com, pany, 95 King St., East, Toronto, Ont., are marketing an electric heating pad with several distinctive features. The Star-Rite pad is well packed in a hinged



box which is sealed in glassine paper. The pad is 12 x 15 inches and has two thermostats, three heats, Cutler-Hammer switch, 6 feet of cord and special plug. The edges are bound with silk thread. A white muslin slip cover comes with each pad.

"Berec" Pocket Meter

Spielman Agencies, 45 St. Alexander St., Montreal, Que., are handling an interesting device for radio fans, known as the "Berec" Pocket Meter. This instrument is designed to be used with radio "B" batteries and registers 0 to 100 volts, and 0 to 10 volts.

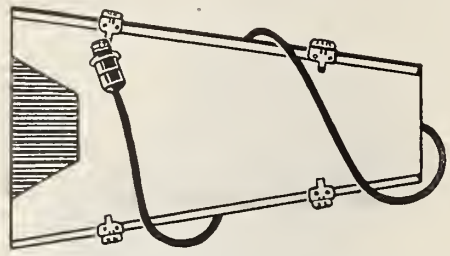


It is of British manufacture and hand calibrated. The case is of moulded black insulating material of diameter 2-1/8 inches. It is stated that the instrument has high internal resistance, ensuring accuracy. The lower voltage scale is made available by pressing a button on the side.

Electric Valet

Home Appliance Manufacturing Company is marketing a pants presser consisting of two metal plates shaped to fit the leg of a trouser and fastened together with spring clamps, arranged in such a way as to get a graduated pressure, depending upon the thickness of cloth of trouser. The plates are lined with cardboard covered with flannel, and are constructed and shaped in such a way as to provide for even pressure over the trouser legs. The device has a cloth covered asbestos heating unit to go between the metal plates. This heating unit derives its heat from coils of resist-

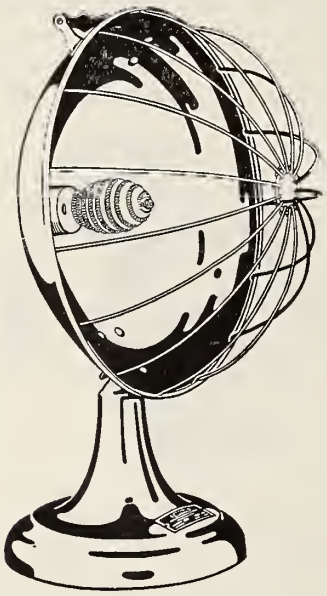
ance wire, and the temperature which this heating unit develops is controlled by a thermostat, which is set at such a temperature as will prevent the scorching of the trousers. In use, one leg of the trousers is



placed on the lower pressure plate. The heating unit is placed on top of this leg and the other leg on top of the unit with the upper plate on top of all and the entire unit clamped together.

Tropical Electric Heater

The Duffie Electric Manufacturing Company are marketing the Tropical Electric heater, a device embodying many new features. The heating element is of special design, and the reflector is of poished alu-



minum, of extra large size. Two sizes are at present manufactured, No. 6, rated at 660 watts, for use in any lighting socket, and No. 9, rated at 1,000 watts. These heaters are guaranteed against mechanical and electrical defects for one year.

A New Type Radio Transformer

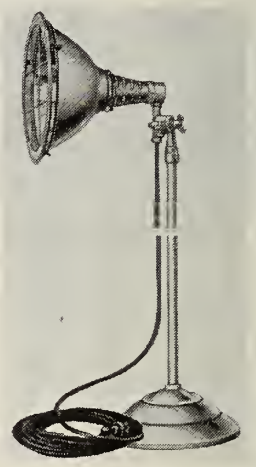
The Dongan Electric Mfg. Company, Detroit, Mich., manufacturers of transformers, have designed an aluminum shield transformer which they believe will give a maximum amplification with no distortion and at the same time embody two of the big selling points of radio apparatus today, viz., beauty and efficiency. These new types, M-6 and M-3, are of 6-1 and 3-1 ratios respectively. Both are entiresly shielded in a neat upright aluminum case with terminals on either side in order to facilitate wiring, where space is at a premium. When used with any of the



available tubes the degree of amplification of this transformer is claimed to be as near perfection as has been attained by any audio frequency transformer.

X-Ray Floodlight

The National X-Ray Reflector Co. of Chicago has announce the development of a new portable floodlight (with centre spot beam) for use in large display work, such as automobile display rooms, etc. It is also used for night-lighting wherever such a portable



flood light is needed. No. 303 can be used for white or colored lighting. Color frame for color lighting is attached. The stand is 54 inches high. The unit takes an ordinary 200 watt mazda "C" lamp. No. 808 is a larger unit of the same height but using a 500 watt "C" lamp ,giving a more powerful Centre Spot Beam. No. 808 is for white lighting only.

Eleven district managers represented Canada in the recent convention of sales managers of the Hoover Company. An interesting statement was made by the president of the company to the effect that 640 out of every thousand wired homes in America have yet to buy an electric cleaner. This emphasizes the fact that a dealer does not need to seek far for a market.

The Lines Electric Co. Ltd., of Drumheller, has been sold to J. E. Rogers.

Current News and Notes

Brampton, Ont.

By a vote of 179 to 9, Chinguacousy ratepayers have granted a franchise to the Cataract Light, Power and Traction Company to supply electricity to the upper half of Chinguacousy Township.

Cobalt, Ont.

Although Coniagas commenced work on Newray less than eight months ago a power transmission line has already been built, heavy compressors installed, steel head frame erected, 415 feet of sinking done and about 1,000 feet of drifting. Together with diamond drilling and preparatory work about $125,000 is said to have been expended.

Colchester Twp., Ont.

A citizens' comittee of Colchester Township, Ont., is negotiating for an extension of Hydro lines from Harrow to Lake Front properties.

Cooksville, Ont.

The Cooksville Ratepayers' Association is exerting every effort to have Hydro lights installed on the two new highways and on some of the side streets of the village. At a meeting a resolution was passed, requesting Major Kennedy, M.P.P., for Peel, to ask for an amendment to the Hydro Act that would permit such additions or extensions.

Chatham, Ont.

The citizens of the village of Wheatley will put forth every effort to secure hydro service within the next few months, according to Dr. Wilson, reeve of the village.

Dawson, Y. T.

Dawson was in direct radio communication with High River, Alta., a few days ago. It is about 1,400 miles distant.

Digby, N. S.

At a recent town council meeting a ratepayers' petition was presented asking that the present steam plant be displaced by an oil engine installation.

Halifax, N. S.

It is reported that a Government wireless station is contemplated for Halifax.

Hamilton, Ont.

Contracts for laying underground the wires in Hamilton's uptown district have been awarded to the Northern Electric Company, as is also a contract for fire alarm boxes. The cable contract was awarded to the Standard Underground Cable Company.

Montreal, P. Q.

Southern Canada Power Company who last year sold two thousand shares of its 6% preferred stock to its customers, has just closed the second campaign in which four thousand shares more were quickly taken up throughout the district over which this company supplies light and power.

After nearly 13 years of faithful work Mr. Albert Senecal has left Montreal Light, Heat & Power Consolidated to take charge of the Illumination Department of the city of Verdun, Que.

Mr. Frank H. Anson, president of the Abitibi Power and Paper Company, died on Nov. 1, at the Montreal General Hospital.

Orangeville, Ont.

The village of Hillsburg has entered into a 10-year agreement with the Cataract Electric Company, Ltd., for light, heat and power.

Ottawa, Ont.

Out of 65 electric railways sending in reports to the Dominion Bureau of Statistics, 14 failed to earn operating expenses during the year 1922, while 51 showed an aggregate net operating revenue of $13,790,501.

Hon. Charles Stewart, Minister of the Interior, announced recently, that the last link connecting Dawson City by wireless with the rest of Canada has been established. The wireless station at Mayo, Yukon, is now in communication with Dawson, and both stations are working satisfactorily.

The North Shore Power Company, which already has a power house on the Batiscan River, and which supplies electricity to several sections of the district of Three Rivers including part of the City of Three Rivers, has obtained the lease of the "Chute de la Cheminee" on the Batiscan river for an annual rental of $1505, this being $5 over the upset price and the company being the only bidder. The total head of water is about sixty feet and the available power is estimated at about 5,000 horsepower.

Work started recently on the Megiscane river for the immediate exploitation of the group of rapids which were leased by auction from the Government by a syndicate including L. N. Huard, of Levis. It is reported that 22,000 horsepower will be developed.

Alfred Cote, son of Charles Cote, St. John street, has been appointed superintendent of the Quebec Railway Light, Heat and Power Company, Montmorency division.

St. John, N. B.

The Musquash plant shut down for a short time recently because the water had got so low that air was coming into the pipe and it was not safe to operate.

Directors of the N. B. Power Company and members of the City Council had a conference recently.

A. P. Paterson and M. A. Pooler spoke for the company, Mr. Paterson complaining that the directors felt it was not fair to them for the civic commission to continue to canvass actively for business while the company was supplying the current to energize the Musquash line and if this course was followed it might possibly be necessary to cancel the agreement.

Shedden, Ont.

On October 29, Sir Adam Beck turned on Hydro power for the first time in Shedden, Ont. The event took place in the Methodist Church, where a fowl supper was served.

On Oct. 31, a fire started in the Dickey Woodworking Mills and as a result the electric light plant was destroyed, and the towns of Shubenacadie, Stewiacke and Milford were in complete darkness.

Timmins, Ont.

An interim report recently issued by Hollinger Consolidated Gold Mines, among other matters states that had it not been for the power shortage the current year would have established a new record for the company. The total loss of production due to power shortage was 522,778 tons, valued at $4,261,-559. The company's power development at the Island Portage on the Abitibi River is being pressed with all possible dispatch with a view to its completion by August 1, 1924.

Toronto, Ont.

M. V. Sauer, hydraulic engineer of design of the Hydro-Electric Power Commission of Ontario, has resigned in order to accept a position as hydraulic engineer of Canadian Vickers Ltd. Mr. Sauer's headquarters will be in Toronto, but he will also be consulting engineer to Vickers Ltd., of England, in connection with hydro-electric developments now in hand or contemplated in several foreign countries. Mr. Sauer left for England and Switzerland on November 10, for a trip of several weeks.

Leonard Palin McClelland, aged 53, died in Toronto on October 29. He was divisional superintendent of the Metropolitan division of the Hydro-Electric Railways.

Sir Adam Beck recently announced that in anticipation of the time when the demand for power in Ontario shall exceed the supply at present available, the Hydro-Electric Power Commission of Ontario is considering plans for the establishment of plants that will generate electricity by steam.

Vancouver, B. C.

Fire recently caused damage to the Crann Electrical Shop in the 400 block, Granville street.

Wheatley, Ont.

A by-law has been passed in Wheatley, Ont., authorizing the council to get Hydro power for the village.

Wiarton, Ont.

At a large meeting of the Wiarton board of trade it was decided to ask the Hydro-Electric Commission to send an engineer to thoroughly explore the possibilities of developing the power at Aux Sauble Falls.

Winnipeg, Man.

The Winnipeg Hydro Electric system will open negotiations with the provincial government to obtain a lease of the provincial power line to Brandon under authority given J. G. Glassco, manager, at a meeting of the public utilities committee.

Yarmouth, N. S.

A radio direction finding station for Yarmouth, N. S., is contemplated by the Dominion Government.

Better-Lighting Campaign in Winnipeg, Nov. 19—Dec 1



Preparatory to putting on their lighting campaign in Winnipeg, a number of the electrical men from that city visited Minneapolis on Ocober 26 and 27 where a similar campaign was under way, to study their methods. The Winnipeg visitors are shown in the above group as follows: front row, left to right: (1) Harry Matthews, department manager, Canadian Fairbanks-Morse Company; (2) A. M. McFadyen, district manger, Standard Underground Cable Company and president Manitoba Electrical Association; (4) D. G. Sutherland, Winnipeg Electric Railway Company; (5) J. H. Schumacher, Schumacher & Gray Company. Back row left to right, (4) Lee Dickson, managing director, McDonald & Willson; (5) R. V. Slavin, sales mgr., Winnipeg Hydro-electric System; (7) M. C. Gilman, sales manager, Winnipeg Electric Railway Company. Numbers 2 and 3 back row, will be recognized as Frank T. Groome and K. A. McIntyre, both of whom are lending valuable assistance in the Winnipeg campaign.

Wiring Contracts Awarded

Brockville, Ont.
A. G. Dobbie & Co., $25,000 office building.

Bowmanville, Ont.
Gus Bounsall, $7,500 house.

Cooksville, Ont.
W. C. Irwin, $4,800 house.

Delhi, Ont.
Wm. Smith, $2,000 house.

Giffard Village, Que.
J. Careau, $55,000 boarding school.
Fortunate Gingras, Quebec, Que., $39,000 school.

Gaspe, Que.
J. H. Paquet Que. Que., $30,000 addition to Bishop's residence.

Gcsfield South, Ont.
Kingsville Electric Co., Kingsville, $8,000 house.

Haileybury, Ont.
Hill, Clarke & Francis Ltd., New Liskeard, separate school; public school.
Toronto Electric Co., Toronto, Ont., $150,000 court house.

Lunenburg, N. S.
Arhur & Conn Ltd., Halifax, $25,000 masonic temple.

Liverpool, N. S.
W. W. Hoyt, Halifax, electric wiring and fixtures $575, public building.

Long Branch, Ont.
J. McNeice, 3 houses on Myrtle Cres., $5,000 each.

Montreal, Que.
H. R. Cassidy, 225 Regent, repairs to residence on Bishop St., $5,000.
J. Anderson, 205 Mansfield, repairs to residence on Pine Ave. W., $12,000.
J. A. St. Amour, 2171 St. Denis, $90,000 hospital on St. Hulbert St.

Mimico, Ont.
Harry Alexander Ltd., Toronto, $20,000 bank.

New Hamburg, Ont.
Geo. Morley, $6,000 house; $4,000 house.

Ottawa, Ont.
A. Wilks, Hull, P. Q., $6,500 house on Sunset Blvd.
W. A. Allen, $6,500 house on Broadway Ave.
Marchand Electric Co., $10,000 duplex residence on McLeod St..

Oakville, Ont.
J. A. Sullivan, $11,000 house on First street.

Port Credit, Ont.
Harris & Marson, 81a Parkway Ave., Toronto, $30,000 store and residence.

Quebec, Que.
Jobin & Paquet, 94 Abraham Hill, Medicine school on Couillard St.

Sussex, N. B.
W. A. Haley has the contract for electrical work on $12,000 store, $28,000 Memorial hall, and $5,000 repairs to post office.

Sydney, N. S.
Campbell & Desmond, $6,000 house on St. Peters Road.

Sandwich, Ont.
Windsor Electric Shop, $14,000 duplex residence on Partington Ave.

St. Catharines, Ont.
C. Widdicombe, residence on Dufferin St.

Truro, N. S.
H. W. Rafuse, $5,000 house on Duke Street.

Three Rivers, Que.
R. Gailliux, $6,000 tenements on Ste. Julie street.

Tracadie, N. B.
Seraphin R. Leger, Caraquet, N. B., electrical work on $5,500 public building.

Toronto, Ont.
Smart & Walsh, $4,000 house at 317 Scarboro Rd.

Waterloo, Ont.
Doerr Electric Co., Kitchener, Ont., $40,000 college.

Windsor, Ont.
Stanley Woodison, $3,500 house on Moy Ave.
A. H. Cook, $4,500 house on Parent Blvd.; $5,000 house on Marantette Ave.

Contractors-Dealers Will Assemble
Remember the one-day convention in Prince George Hotel, Toronto, November 26. James R. Strong will speak. Next day a similar gathering will be held in Montreal.

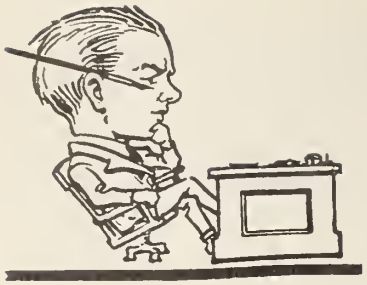
Business Changes

E. J. Hogan Electrical & Mechanical Co., has been recently registered in Montreal.

The Ontario Gazette announces the incorporation of Jack V. Elliott, Limited, with head office in Hamilton, Ont., capital $40,000, to manufacture and sell radio equipment, and with other powers.

The Canadian Novelty Importing Co., under Mr. F. Strachan, are opening for business in the near future at 423a Yonge St., Toronto, Ont. Mr. Strachan states that he will carry a complete line of electrical goods and that a large part of the stock will be imported direct. Before starting in business for himself, Mr. Strachan was with the W. C. Hunt Manufacturing Company, of Toronto.

P. A. Cheevers, proprietor of the Art Electric, 355 Yonge St., Toronto, Ont., is discontinuing all lines of electrical goods other than ranges and washers. Mr. Cheevers states that the extent of his business in the lines mentioned is such that in addition to contracting and commercial lighting, he has no time to handle the smaller goods.



The Editor Comments

We Have Ideal Mining Conditions

The application of electricity to various Canadian industries, which has been the subject of a series of investigations and articles in recent numbers of the Electrical News, presents no more interesting phase than that found in our various mining operations, to which attention is given in this issue. Electricity is now recognized as the first essential in mine work. Illumination, and power in the form of motor drive, traction, smelting, and electrolysis is the modern way because it is the safest and the most expeditious and efficient.

It follows that the successful operation of any mining district is also inseparably associated with hydro-electric power development. Examples are seen in such developments as the West Kootenay and East Kootenay power companies and the Comox development of the Canadian Collieries in British Columbia. More recent are the power plants at Sturgeon Falls, Indian Chutes, Quinze River and Island Portage in Northern Ontario, the two latter not yet operating.

The field is too large to cover within the pages of one book and we have only attempted to give the reader an idea of general operations by the description of particular and individual installations which may be considered as types. To this end our articles deal chiefly with mining in Northern Ontario and the Comox, B.C., field. Our typical power plants are taken from those districts. The motor installation in the Dome and the electrical layout there are given as typifying what is found, on a smaller scale generally, in the other mines.

Had space permitted it would have been interesting at least to have spoken of the possibilities of the future of what we may call "Mining Electrically." Canada is fortunate in the possession of areas where mineral wealth and water power are found in close proximity. This is nowhere better exemplified than in Northern Ontario where at the same time we have estimated water power in the neighborhood of a million horsepower together with the confident assurance that the mineral resources are merely scratched. If our brief dissertation on the use of electricity in the mining industry does nothing more it will at least serve as an introduction to a development which in the years to come promise to be in the same class with our agricultural and forest heritages.

The Art of Losing Gracefully

Said a well-known sales manager in conservation with "Electrical News" recently:

"The art of losing is, perhaps, one of the most difficult the salesman has to learn. We all can win cheerfully.. If we have the goods the customer wants and with which we know she will be satisfied when she gets home, then it's all very easy. But it's when one can't satisfy her that his salesmanship is put to the highest test. Then it is that he shows his skill, or the reverse, in losing. Of course a salesman of the high-powered type may talk the customer into buying something she doesn't like, and imagine that he has actually won. He has won a sale sure enough and lost the chance to make a customer.

"But suppose one does allow the prospect to leave the store without buying, that is certainly nothing to congratulate oneself about, unless he has sent her away in the proper mood. There are two mistakes that are frequently made. One is when the salesman exerts himself to the limit to sell the customer and shows his disappointment and annoyance when he fails. His prospect will share the annoyance and probably never enter the store again. Then there is the other extreme, in which the salesman puts so little force and personality into his sales' efforts that the customer leaves the store entirely unimpressed and probably forgets the incident entirely.

"The true salesman avoids both extremes. It does not take him long to determine whether or not he is in a position to satisfy the customer's needs, and when he sees it is impossible he does not weary her with an endless quantity of merchandise quite unsuited to her requirements. Nor does he make it so difficult for the customer to get away that she is sorry she came. On the contrary she will find him so full of interesting ideas and suggestions regarding matters pertaining to electrical goods that she will consider the time well spent even though he is unable to supply her with just what she is looking for. As she leaves the store, she will be sorry she has to do so without buying—for she will say to herself, 'that salesman was so courteous, helpful and intelligent, I wish I could have bought from him—but I'll surely go there again.'

"Thus it is that one wins by losing gracefully—a difficult art, but one well worth cultivating."

Customer Ownership Successful Customer ownership of public utilities, by purchase of stock, is making headway in Canada. Some months ago the Southern Canada Power Company pioneered the movement by offering to customers of the company some 2,000 shares of preferred stock. The amount was over-subscribed. A little later, the Ottawa Light, Heat & Power Company, requiring more capital for necessary extensions, offered an issue of preferred stock to Ottawa citizens. Here again the popularity of the customer ownership idea was demonstrated in spite of the fact that the city of Ottawa has its own municipal system. Now, during the last week of October the Southern Canada Power Company has again made an issue to its customers,—this time twice the amount formerly offered—and again the amount was far oversubscribed, long before the time limit had expired.

Looking at this form of customer ownership from an impartial angle, it would seem that it has now been demonstrated that it fits the needs of certain districts better than municipal ownership as we know it in Canada. Customer ownership, through individual purchase of securities, had made very considerable headway in the United States before it was tried out here. Its introduction in the States has undoubtedly satisfied the demands of many who were inclined to look to Canada, and especially Ontario, for the solution of uncomfortable relations often existing between company and customer. The province of Quebec also would seem to be so circumstanced that this new customer ownership will very largely solve their problems. Whether it would have satisfied the people of Ontario, had it been introduced fifteen or twenty wears ago, no one can say. At this date it doesn't matter, for Ontario is committed, body and soul, to a policy on which it must stand or fall. Indeed that would seem to be the very foundation of Ontario's security.

Public utilities all across the Dominion are greatly indebted to these two Canadian companies for the experimental work they have undertaken. The results will be very eagerly watched.

Writings of Steinmetz Will Live

B. G. Lamme, chief engineer of the Westinghouse Electric & Manufacturing Company comments as follows upon the death of Dr. Charles P. Steinmetz, consulting engineer of the General Electric Company.

"'I deeply regret the loss of Dr. Steinmetz as a personal friend and because his death means the passing of a brilliant analytical engineer. He was a very able man who contributed much to the electrical industry, which will mourn his passing.

"Dr. Steinmetz and I entered the electrical business within a month of each other in 1889. He was associated with the Eickomyer Company of New York for several years after he first came to this country. In this time his writings on engineering subjects attracted much attention in electrical circles and he soon joined the General Electric Company.

"He entered the electrical industry at the start of what engineers call the analytical period when mathematical analysis took the place of "cut and try" experiment. His greatest fame was achieved during the period of rapid electrical expansion, during which he contributed greatly to scientific analysis of electrical phenomena.

"Unlike many brilliant engineers, he left a record of his work in his numerous writings so that his contributions to science will live in engineering journals. He was a prolific writer on diversified subjects and his keen mind was no more clearly displayed anywhere than in his contributions to scientific journals."

Making Electricity Safe

Electrical power is safe power when used under conditions which are very well known. To have fewer electrical fires we need, not more knowledge or theory, but more practice of what we already know or should promptly learn from readily available sources and more readiness to utilize this knowledge persistently, and to stop being willfully or ignorantly careless.

Dana Pierce

The New Public Ownership

Final details of the second Customer Ownership Campaign of the Southern Canada Power Co. show the following results:

In 1922, the first campaign, 2358 shares were sold to 932 shareholders in 4 days; in 1923, 5485 shares sold to 1668 shareholders in 2½ days.

The campaign opened on October 27th, to run for ten days, with 4,000 shares as the objective. The company had to call the sale off at noon on the following Tuesday—that is, in 2½ working days—with the issue nearly 40% oversubscribed, and any amount of additional orders to be had if they could have taken them.

The sales were all made by the members of the company—linemen, wiremen, power house operators, meter readers, clerks and superintendents—and they certainly did some work, 204 of them having made 10,261 calls during the campaign.

This campaign added about 1300 new families to the former list of shareholders, so that there is now a little over 3,000, out of 15,000 customers, financially interested in the success of the company—over 20%.

The total amount of electric power exported from Canada to the U. S. during the fiscal year 1923 was 1,054,872,585 kw.h., an increase of 193,305,402 kw.h. over 1922.

Northern Electric Power Develops

Fabulously Rich Mining Fields

Ontario's Hidden Wealth Lies Northward—Twenty Central Stations Feed the Mill Motors—Gold, Silver, Nickel Enough for the World*

A trip to the mining districts of Northern Ontario reveals tremendous potentialities of resources, staggering in their vast extent. However much the visitor may have conned his maps and reports, he is unprepared for the reality of the North's evidences of wealth—mines on every hand, and these but the advance guard of the hosts that will follow when farther untouched and undiscovered fields are opened for development.

Cobalt is the beginning. It starts to register the North's immensity on the visitor's consciousness from the moment he hits the station platform. First score, perhaps, goes to Nipissing Mining Company, across the narrow expanse of Cobalt Lake. A grey mass of buildings, perched high on grey rock—impressive in their expanse, in their situation, and from the peculiar dull roar that emanates from the stamps. There is not much visible activity, but suspended high over the water the aerial tram runs ceaselessly back and forth, feeding the mill from a second shaft. That is Nipissing Mining Company, from the outside. The interior is full of electrical machinery, described elsewhere, where an idea is given of the uses to which over 3000 horsepower of electrical motors are put.

Other mines abound in the Cobalt district. On every hand there we find the familiar shaft heads, the tram lines, the dump trucks, and the dead grey of the tailings. It is true that some are no longer worked, but their shells remain, silent witnesses of an activity that is past.

Transmission lines run in every direction from the sub-station of the Northern Power Company, on the Nipissing side of the water. This company generates over 20,000 horsepower from 4 plants—some indication of the power requirements of this district.

*It will be recognized that all the widespread mining development of Canada can not be touched in a single issue.

The latest complete statistics on silver mining show that the production in Ontario in 1921, was valued at $6,116,037. Of this amount the Cobalt district produced 5,060,454 ounces, claimed to be 51.8 per cent. of the total Canadian output.

Cobalt and its immediate surroundings have lost the glamour of early days. The district has settled down, the remaining mines are steady producers, their power problems are largely solved, and there remains only the steady forward march of settled industry.

Indian Chutes

Presumably the visitor is an electrical man, and would like to see one of the newest power developments in the north country. He can gratify his wish by a trip to the Indian Chutes plant of the Great Northern Power Company. A branch line train will take him from New Liskeard to Elk Lake, and then there is a trip up the Montreal River of several hours, to the power site. This plant presents several interesting features described elsewhere in this issue. The power is being sent up Timmins way, and another line is projected in to Gowganda. At the time of the visit of the Electrical News representative, construction had just been completed, and the staff were looking forward to the time when they would make their last trip down the Montreal to Elk Lake.

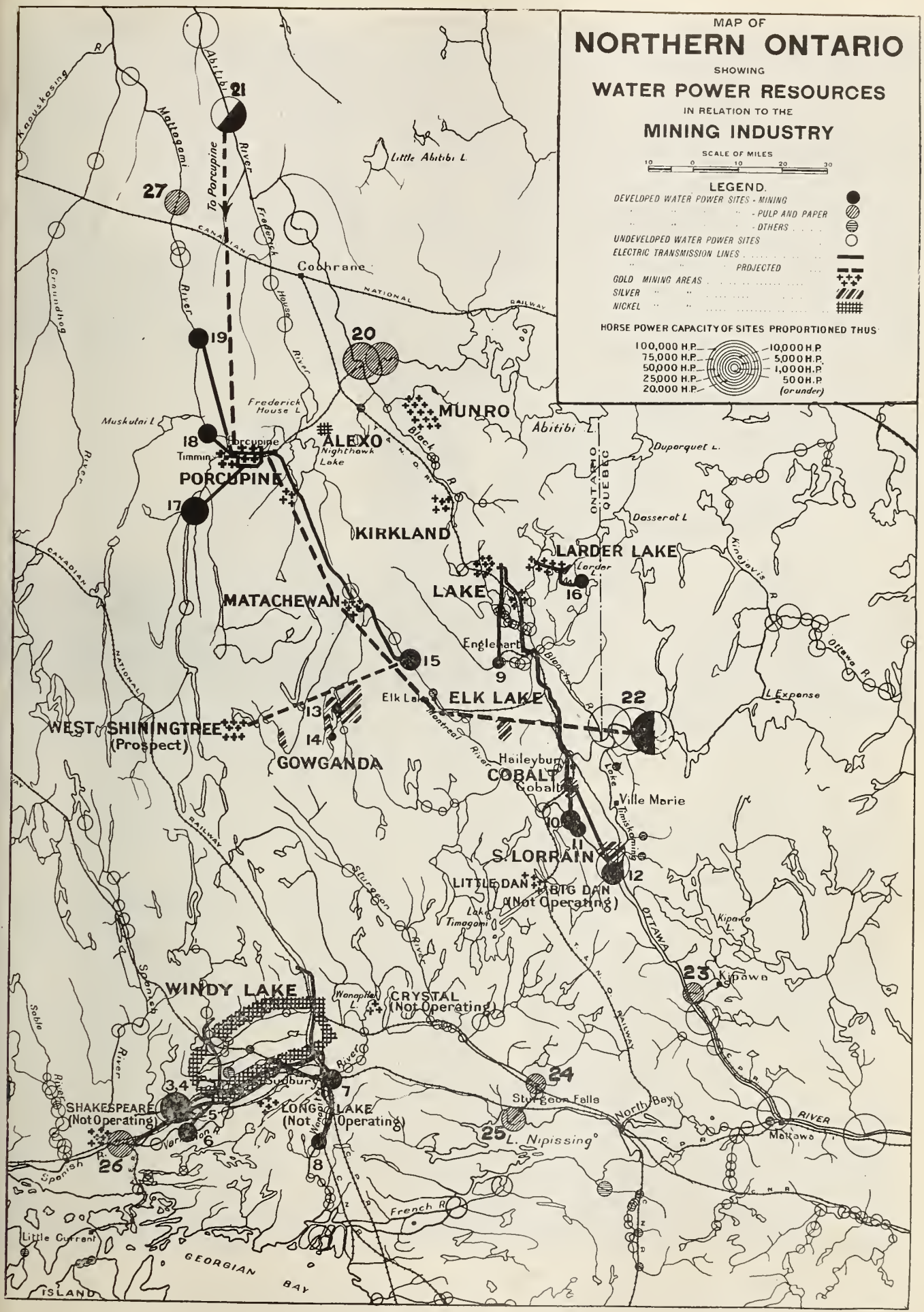
Porcupine

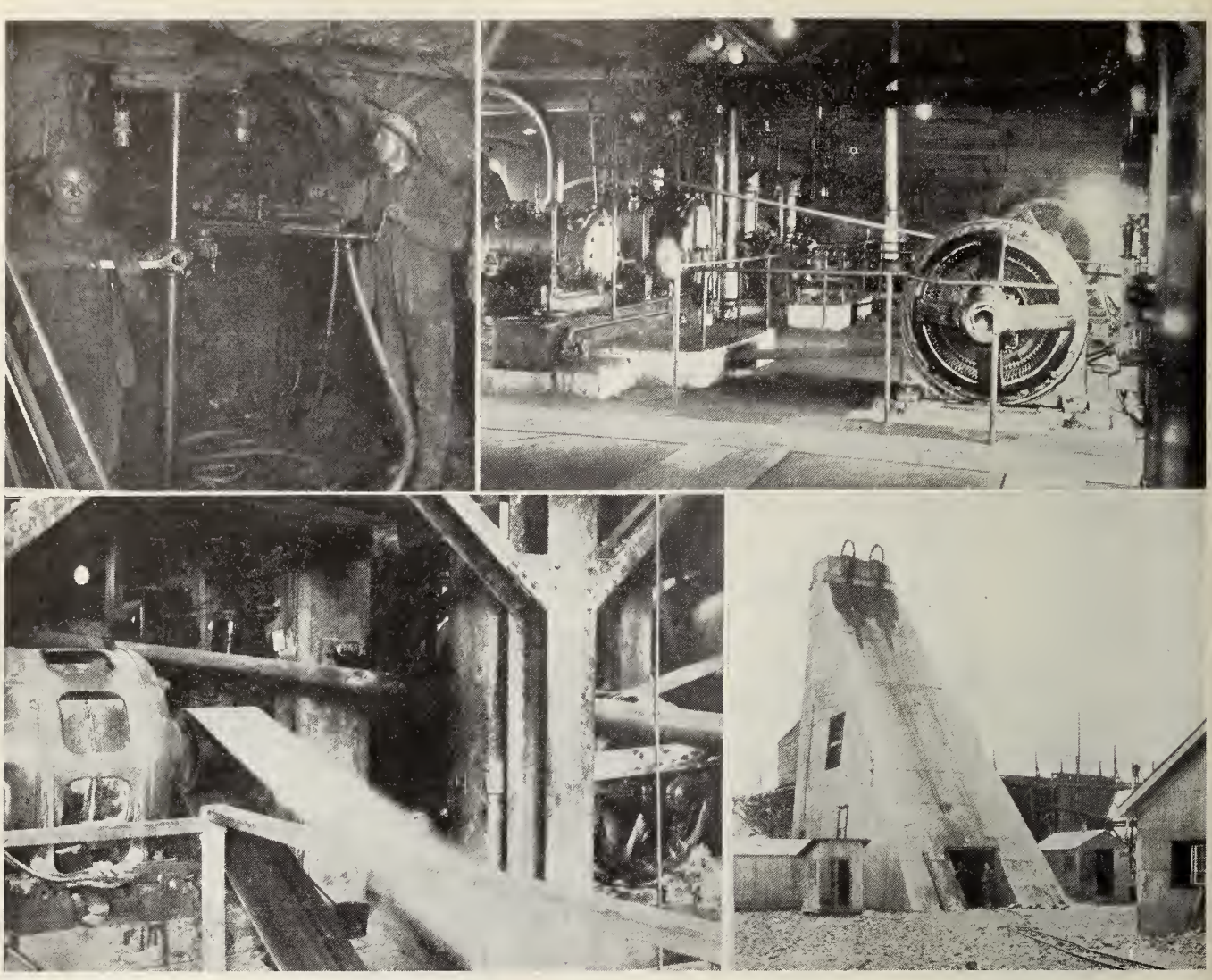
A further jaunt to the North carries one into the neighborhood of Kirkland Lake and Larder Lake, and the mining camps of like name. Power developments exist in the neighborhood at (No. 9) and (No. 16), as shown on the key map, this issue, but they are not of large size, most of the power used coming from outside. One must mention the splendid power

Location of Northern Ontario's Power Developments.

(For Key Map see opposite page)

Map No.	Power Company	Location	H.P. Capacity
3	International Nickel Company	Spanish River	13,800
4	International Nickel Company	Spanish River	7,500
5	Lorne Power Company	Spanish River	4,800
6	Lorne Power Company	Vermilion River	4,800
7	Wahnapitae Power Company	Wahnapitae River	6,600
8	Wahnapitae Power Company	Wahnapitae River	3,600
9	Northern Ontario Light & Power Co.	Blanche River	1,080
10	Northern Ontario Light & Power Co.	Montreal River	5,340
11	Northern Ontario Light & Power Co.	Montreal River	3,040
12	Northern Ontario Light & Power Co.	Matabitchouan River	11,000
13	Gowganda Power Company	Montreal River	800
14	South Bay Power Company	Montreal River	250
15	Great Northern Power Company	Montreal River	6,000
16	Associated Gold Fields	Raven River	1,600
17	Northern Canada Power Limited	Mattagami River	14,900
18	Northern Canada Power Limited	Mattagami River	4,900
19	Northern Canada Power Limited	Mattagami River	8,000
20	Abitibi Power & Paper Co.	Abitibi River	28,000
21	Hollinger Consolidated Gold Mines	Abitibi River	24,000
22	Northern Canada Power Co.	Quinze River	26,000
23	Riordan Company, Limited	Ottawa River	7,200
24	Spanish River Pulp & Paper Co.	Sturgeon River	10,400
25	Spanish River Pulp & Paper Co.	Sturgeon River	13,390
26	Spanish River Pulp and Paper Co.		4,950
27	Mattagami Pulp & Paper Co.	Mattagami River	9,350


MAP OF
NORTHERN ONTARIO
SHOWING
WATER POWER RESOURCES
IN RELATION TO THE
MINING INDUSTRY
SCALE OF MILES
10 0 10 20 30
LEGEND.
DEVELOPED WATER POWER SITES - MINING
- PULP AND PAPER
- OTHERS
UNDEVELOPED WATER POWER SITES
ELECTRIC TRANSMISSION LINES
PROJECTED
GOLD MINING AREAS
SILVER
NICKEL
HORSE POWER CAPACITY OF SITES PROPORTIONED THUS
100,000 H.P.
75,000 H.P.
50,000 H.P.
25,000 H.P.
20,000 H.P.
10,000 H.P.
5,000 H.P.
1,000 H.P.
500 H.P. (or under)
Kaouskasing R.
Abitibi River
Mattagami River
To Porcupine
Little Abitibi L.
Frederick House River
Frederick House L.
Coochrane
CANADIAN NATIONAL RAILWAY
Groundhog River
Muskutai L.
Porcupine
Timmins
PORCUPINE
ALEXO
Nighthawk Lake
MUNRO
Abitibi L.
Duparquet L.
Black R.
N.O.R.
ONTARIO
QUEBEC
Dasserat L.
KIRKLAND
LARDER LAKE
Larder L.
LAKE
MATACHEWAN
Englehart
Blanche R.
Kinojevis R.
Ottawa R.
L. Expanse
ELK LAKE
Elk Lake
Montreal River
WEST SHININGTREE
(Prospect)
GOWGANDA
Haileybury
COBALT
Cobalt
Ville Marie
Timiskaming
S. LORRAIN
LITTLE DAN
BIG DAN
(Not Operating)
Lake Timagami
Sturgeon River
Kipawa L.
Kipawa
OTTAWA
T. & N. O. RAILWAY
WINDY LAKE
Wanapitei L.
CRYSTAL
(Not Operating)
Sudbury
Spanish River
Sobie River
SHAKESPEARE
(Not Operating)
LONG LAKE
(Not Operating)
Wanapitei R.
Sturgeon Falls
North Bay
L. Nipissing
Mattawa
RIVER
C.P.R.
C.N.R.
Spanish R.
French R.
Little Current
GEORGIAN BAY
ISLAND



Typical views in the mining districts—Upper left, rock drillers at the "face"; upper right, compressor room at Vipond; lower left, motors at the McIntyre; lower right, shaft house at Vipond

development of the Abitibi Power and Paper Co. at Iroquois Falls. Here is one of the finest hydro-electric developments in the country, and the applications in the paper mill are of extreme interest. Every day 1100 men report for duty in this one building. A description of this mammoth organization is not within the scope of this present issue, but will appear in a future issue of the Electrical News.

Porquis Junction is one of the busiest places on the line of the T. & N. O. Railway. This point is the spot from which the traveller leaves the main line for the Porcupine area, and incidentally for Iroquois Falls, just mentioned. A short journey carries him past the expanse of Frederick House Lake, then through various small stations that are evidence of the growing cultivation of the country, and finally into the up-to-date station at Timmins.

The Gold Country

Here beats the heart of the gold country. Cobalt's mines were impressive, but these are stupendous. Mountainous piles of buildings appear in every direction, and at night one can still sense them, from the ever-present sound vibration of the milling operations.

Just a few figures will show what this immensely rich area means to Ontario. During September of this year nine Ontario gold mines produced over $1,900,000, claimed to be the greatest output in any one month since the mines were established. These producers were in order of size, Hollinger, Dome,

TABLE 1

Power and Machinery Employed in all Operating Gold Mines and Mills in Ontario, 1921*

Kind	No. of Units	Total H.P.
Boilers—Fired by hand	63	6,153
Stationary Engines—		
Steam	21	1,593
Gas	1	7
Oil	1	25
Air	2	12
Hydraulic turbines	1	325
Locomotives—		
Electric	20	438
Gasoline	1	10
Electric Motors—		
Alternating Current	409	26,206
Direct Current	1	275
Generators—		
Alternating current	6	2,100 kw.
Direct current	18	497 kw.
Air compressors	33	2,637 cu. ft. per min.

*During the intervening two years a very marked increase in the use of electric motors is noted.

McIntyre, Teck-Hughes, Wright-Hargreaves, Lake Shore, Kirkland Lake and Croesus. It will be noted that all of these are not in the Porcupine district. Over 5000 men were employed in the mines, and 216,000 tons of ore were treated. Recent figures on the amount of power used are not available but it may be of interest to note that during 1921 over $640,000 was expended by Ontario gold mines for power for mine or mill use.

Table I, published by courtesy of Mr. R. H. Coats, Dominion Statistician, gives a summary of power equipment used in all gold mines of Ontario, Machinery used in generating plants is not included:

A traveller might spend days in the vicinity of Timmins, examining the different mines. We cannot attempt to describe them all, but we refer the reader to the discription of the Dome Mine elsewhere in this issue, and to the photographs of machinery used, as typical examples of what makes this neighborhood a great gold producer.

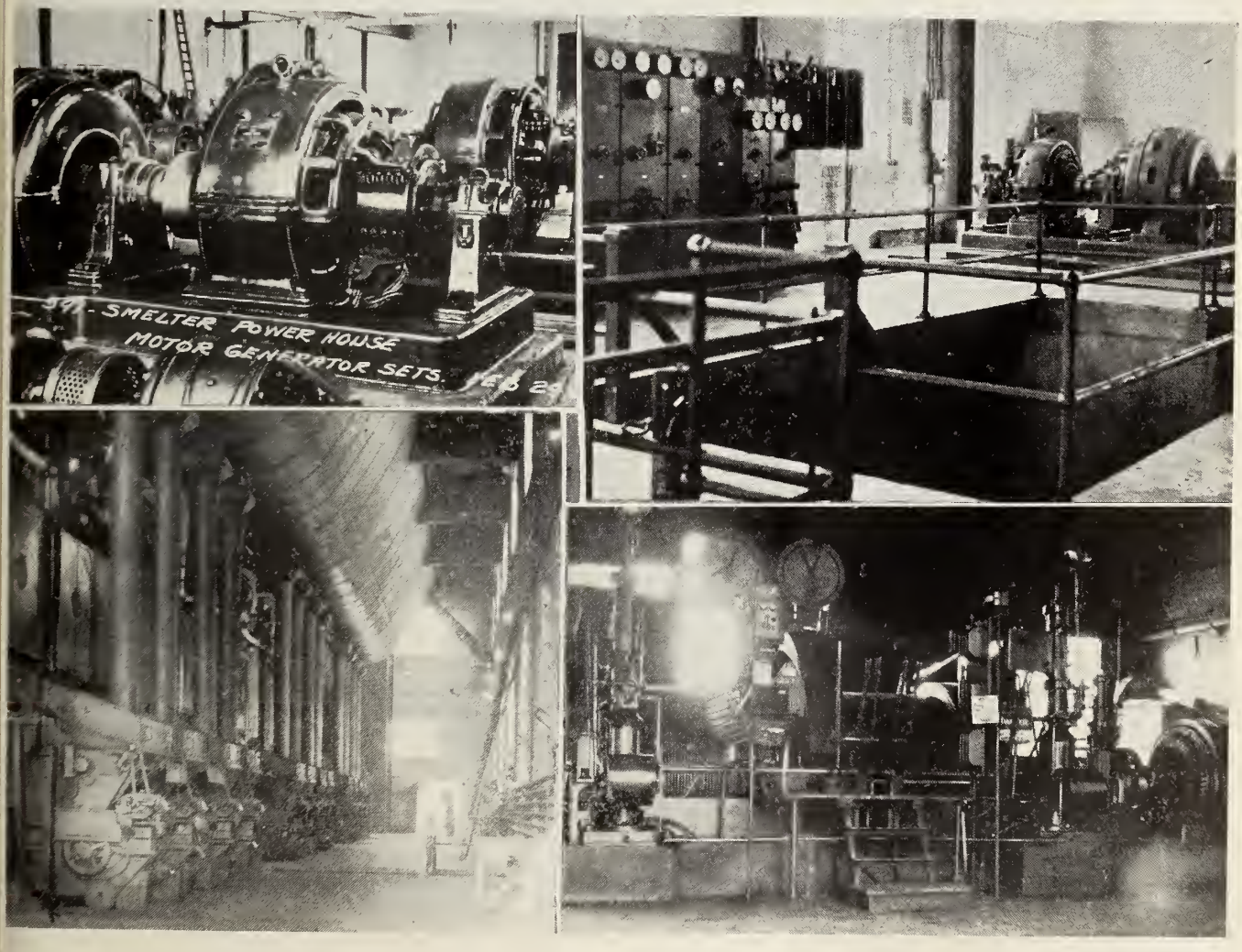
There are several important hydro-electric developments in the neighborhood of Timmins, on the Mattagami River, all of them owned by Northern Canada Power Limited. These are shown on the key may accompanying this article as Nos. 17, 18, 19. Numbers 17 and 18 are the plants at Sandy Falls and Wawaitin, which have been previously described in the Electrical News. The new development is No. 19, at Sturgeon Falls, and represents a large addition to the power resources available for mining purposes in Northern Ontario.

A full description of this plant will be found elsewhere in this issue.

Development

Even a short trip of the scope we have indicated impresses the observer with the fact that present development in Northern Ontario is but the beginning of what we may ultimately expect. Everywhere there is talk of new prospects, new finds, of discoveries in hitherto unexplored fields. That electrical development will keep pace with this expansion there can be no doubt. At the moment, at Ka-Ka-Ke Falls on the Quinze River, a development of 20,000 horsepower is being made for Northern Canada Power, Limited. This plant will ultimately have 60,000 horsepower and there is no doubt of the prospective market. Hollinger Consolidated Gold Mines are now building their own power plant on the Abitibi, (No. 21) and when this is completed much power will be available for other mines from the Northern Canada Power Limited, the source from which Hollinger is now supplied.

All these things considered, there is no room for doubt. Her mining areas are one of Ontario's greatest assets. Left free to develop, they will become the balance wheel that steadies the industry of the whole province.



t the Nickel Mines—Upper left, motor-generator sets supplying current to locomotives on blast furnace at Murray mines; upper right, another view of the same; lower left, automatic stokers and boilers at Murray Mine; lower right, electric hoist at Worthington mine

Silver Mines Use Many Motors

How the Ore is Treated in the Nipissing—A Devious Course Through the Mill, Where All Power is Supplied from Electric Motors

Electricity in the Nipissing Mine is used for a diversity of purposes. Current comes in to the property at 11,000 volts from the transmission lines of the Northern Ontario Power Company. It feeds to the transformers through six, horn-gap type Swedish General Electric lightning arresters. The total installed capacity in the transformer house is 1,350 kv.a., consisting of three 300 kv.a. oil cooled Westinghouse transformers and three 150 kv.a. Swedish General Electric transformers. These step the current down to 550 volts at which potential it goes through a Westinghouse oil switch and a split 3-phase circuit is used to carry current to the mill building, thus avoiding "skin effect." A Westinghouse graphic meter is used to check all current.

The main switchboard in the mill building consists of nine panels. Heavy current demands from the tube mills necessitate these panels, each of which consists of ammeter, volt meter, contact breaker and starter for the individual mills. The other three panels include an integrating panel, with Ferranti graphic meter, and integrating watthour meter and main volt meter, a lighting panel with primary and secondary switches, and a panel for the precipitation room.

At the top of this board and just behind it, runs a horizontal bus-bar with knife switches which may be opened from front of the board. This bus-bar feeds six general motor circuits.

The Course of the Ore

The peculiar situation of the Nipissing Mine lends interesting variety to the method of ore supply. One shaft is located some distance from the mill across a small lake, and the mined ore from this shaft is carried across the water on an aerial tram. The buckets of this tram run on an endless cable driven by a 15 horsepower motor, and finally dump the ore at some three thousand feet from the shaft into a bin connected with the main crusher. Ore from nearer at hand is run up an ordinary trestle tramway. The tram cars are hauled up to the mill, which is considerably elevated, by a 30 horsepower C. G. E. motor, and return by gravity. Incidentally, this tram-line brings up all supplies to the mill.

From the main bin the ore runs through two crushers driven by one 20 horsepower Westinghouse motor. As it comes from the first crusher, it is conveyed by an Otis-Fensom elevator, with 7½ horsepower motor, to the main ore bins. From these bins it goes over a conveyor belt with magnetic pulley, which separates steel and scrap iron from the core. For this magnetic pulley, current is derived from a ¼ kv.a. Wagner generator.

This belt feeds the second crusher which passes the ore to a conveyor belt (driven by a 5 horsepower Westinghouse motor) which feeds a bucket elevator (7.5 Westinghouse motor) that fills the bins for the stamps.

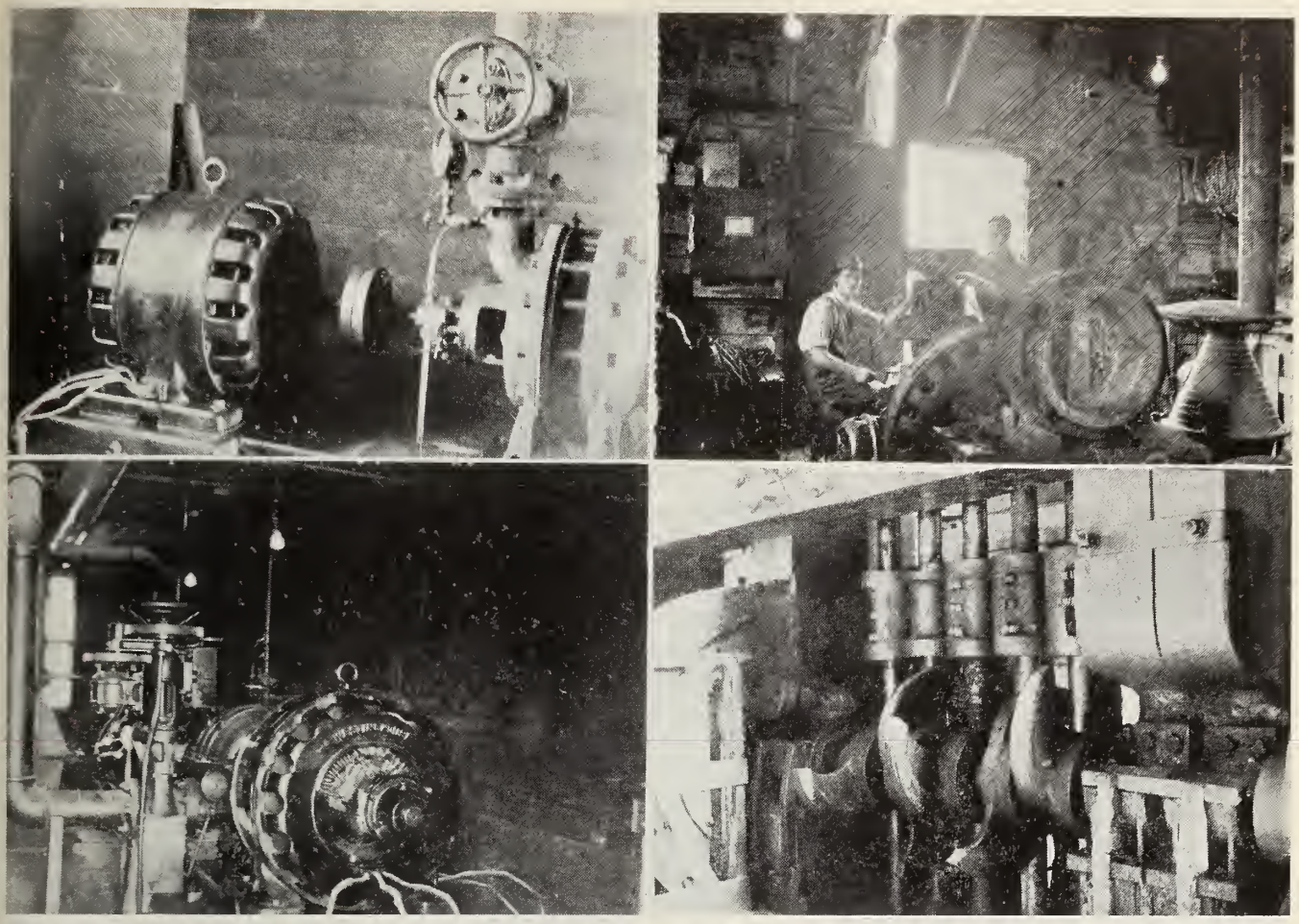
The stamps are one of the most interesting features of mining equipment, due to their impressive appearance, and to the large amount of power required for their operation. In the case of the Nipissing mine, there are 40 stamps, each set of 10 driven by a 40 horsepower Westinghouse motor, with suitable switchboard and controlling instruments. The crushing action of the stamps reduces the ore to a greater degree of finensss and it leaves them to go through still further milling operations. It should be noted that at this point a solution is used and the ore travels in a semi-liquid form through what are known as launders, which are similar to open penstocks of small size. These launders feed from the stamps to the concentrating tables, operated by a 15 horsepower Canadian General Electric motor. From the tables it comes to the bowl classifier, operated by a 5 horsepower motor.

The action of the classifiers is to take the finer particles from the mass and to send them on their way into the tube mills (tubes half full of small steel balls) which perform the function of grinding and still further reduce the size of the particles. These fine particles from the tube mills come into the agitator tanks. At this point it should be explained that the Nipissing has five low grade tube mills and one high grade tube mill, each driven by one 125 horsepower Westinghouse motor. Arrangements are provided so that the coarser material goes back to the tube mills and is reground till it is of the desired size.

The agitation tanks are twelve in number and may be described as the first step in the chemical treatment of the ore. They are operated by one 75 horsepower Canadian General Electric motor. Their operation results in a solution which contains the silver, together with a muddy precipitate. The mixture runs from the agitator tanks to what is called the "low grade" filter operated together with the filter pump by a 40 horsepower Canadian General Electric motor. As its name implies, the filter acts in the capacity of a separating agent removing this solution from the "Cake."

The solution which contains the silver is then precipitated with sodium sulphide through presses, which are driven by 10 horsepower and 15 horsepower motors. It then becomes necessary to desulphurise the ore, which is accomplished in a tank stirred up by an agitator, with a 10 horsepower motor drive. The resulting product is a black mud which goes to the refinery where it is charged directly into reverberatory furnaces. The furnace produces the silver in an almost pure form. It is generally cast in bricks of a certain size. Some electric power is used in the refinery, amounting to about 25 horsepower, mainly required for the blast furnace compressor and certain pumps.

This description of the treatment of the ore has neglected mention of the operations to which the "high grade" is subjected. The process is separate. Concentrators from the two sets of tables are used



Upper left—a turbine pump at the Nipissing; upper right, the electrical repair shop; lower left, a motor-driven fire-pump, lower right, a stamp battery (not at Nipissing Mine)

and these are charged daily into No. 5 tube mill (driven by 100 horsepower motor) where they are ground for 23 hours and then discharged through classifiers, from whence they go to the collecting tank (20 horsepower motor). From the collecting tank they are drawn for cyanide treatment and the rest of the process is the same as for the "low grade."

Various motors are used in the working of the mine itself.

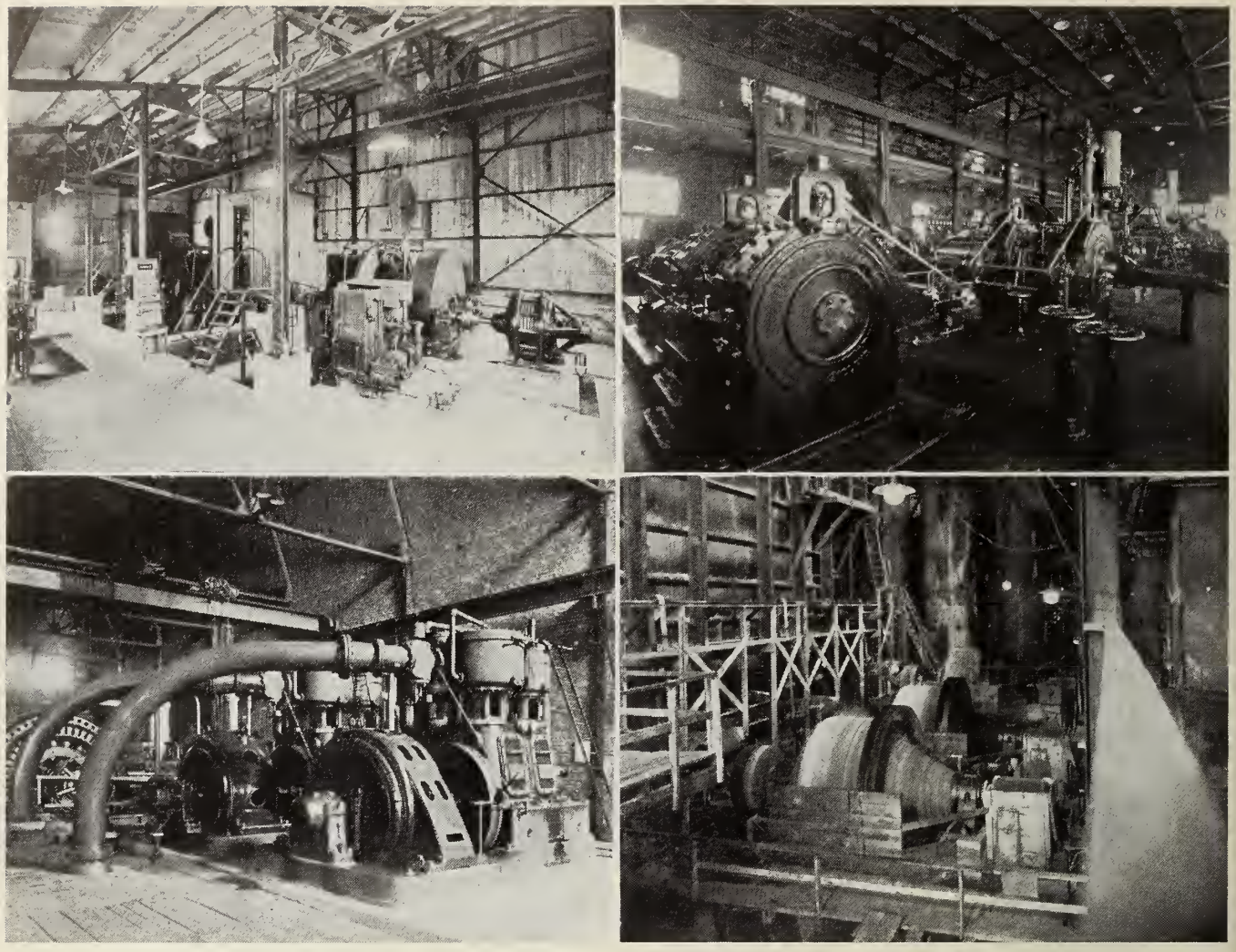
For pumping from the the 400 ft. level to the surface, a 30 horsepower squirrel cage type, 550 volt Siemen's induction motor is used. This motor is totally enclosed and is direct-connected to a centrifugal pump. Other methods are used for removing water from the different levels such as air lift and Triplex pump.

The main shaft hoist is electrically operated, propelling power being supplied by a 52 horsepower C. G. E. slip ring motor. This motor has special control apparatus which was manufactured at the mine. This control is of the liquid type having three stationary tanks of fixed density electrolyte with three movable electrodes which in turn are controlled by main lever. Safety devices on this control were also manufactured at the mine. There is a push button on the floor and if the operator takes his foot off anywhere between levels or above deck the motor is automatically shut down and brakes applied. This button is in connection with an instrument provided with spacings at different levels which allow the hoistman to stop at any one level without interfering with the power. There are two brakes, a standard hand brake and an electric brake which latter automatically operates on the first step of power to main motor. This brake is of rotary magnet type. Over wind protective devices are also provided in connection with a back-out switch.

In the underground workings, two locomotives are used, one 3½ ton Whitcombe using a 58 horsepower C. G. E. motor and propelled by Edison cells. Another locomotive is a 1½ ton machine supplied by the Automatic Transportation Company.

Bell signals in the mine are worked from a 12 volt secondary transformer and were designed by the electric staff. The mine lighting is from cables with weatherproof sockets and guards.

In the above article describing this mine only certain manufacturers are mentioned. It should be pointed out that in any single case a large number of representative manufacturers are bound to be omitted. The following list includes the names of several others: Canadian Westinghouse Co. Ltd.; Northern Electric Co. Limited; S. Morgan-Smith Co.; Britannia Wire & Rope Co. Ltd.; Mine & Smelter Supply Co.; Vancouver Wood Pipe and Tank Co.; Jones & Glassco; Ferranti Meter & Transformer Co.; Moloney Electric Co.; N. Slater Co.; Canadian Crocker-Wheeler Co. Ltd.; Lancashire Motor & Dynamo Co.; Canadian Ingersoll Rand Co.; Canadian General Electric Co.; I. & N. Co.; Ferguson Pailin, Ltd.



Upper left, the Dome hoist; upper right, compressor room in Hollinger lower left, vertical compressors in Dome; lower right ball mills in Dome

Gold Mine Electrical Equipment

143 Motors in Big Dome Representing a Connected Load of Over 4,000 Horsepower—Underground and Maintenance Work

Investigation of any large mine in Northern Ontario reveals an immense amount of electrical equipment. Motors by the hundred, miles of cable, huge banks of transformers, hosts of miscellaneous apparatus—all this is grouped under the grey roofs of the mine buildings. A little further from observation is a large amount of equipment used in the underground workings, which includes motors (for crushers), electric locomotives, switchboards, signal systems and so on.

The accompanying illustration gives some idea of the amount of electrical material used in the Dome Mine. This plan was redrawn and reduced from a large drawing used by the electrical staff of the mine, showing the entire cable distribution with motor and panel layout. In a table which is reproduced elsewhere in this article will be found numbers corresponding to those shown on the plan, from which the reader will gain an idea of just how big a mine the Dome is. 143 motors with their aggregate horsepower is no small item even when compared with the largest industrial manufacturing plants in the country.

The process of getting out the ore from its natural resting place as carried out in the Dome, is very much like that employed in other mnes. A summary of the process may be given as follows:

The first stage, of course, in getting out ore occurs underground where the newly broken up rock is drawn from the chutes by electric locomotives. These dump into loading pockets, from which are filled skips that are hoisted up the shaft and dumped into the ore bins in the head frame.

The next stage is the crushing, and the ore travels to the surface crushers from the shaft head in a 25 ton cable car and is reduced to fairly small size. A belt conveyor carries the crushed pieces to the mill where the ore begin its devious course through stamps or ball mills, tube mills, and so on.

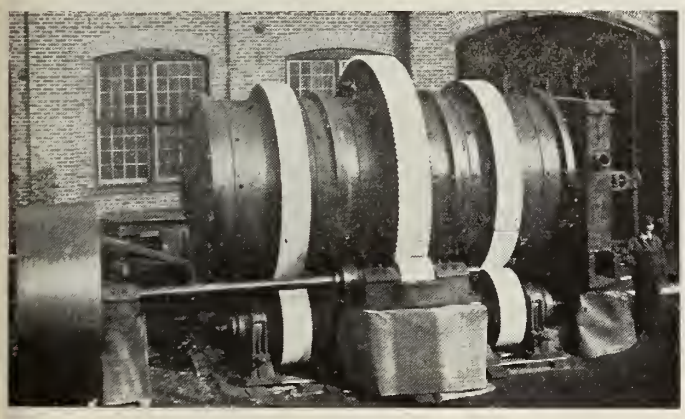
Mr. G. A. Rowe, chief electrician of the mine, has given the Electrical News some interesting particulars of the work which he does on the mine equipment. As may be expected in any plant where machinery is used to do work day in and day out, parts wear out and contacts corrode, valves pit, installation deteriorates and so on, and maintenance is a

considerable part of the work. In the Dome however, (and we believe the circumstance is not uncommon in the North country), all repairs are done on the premises. Nothing is sent out. In fact, it may be said that motors are wound from the iron up.

Mr. Rowe is particularly pleased with his compressors, some of which are of the vertical type. He states that there is in the Dome a total connected load of over four thousand horsepower and he has continually on hand about 150 motors. The power factor of the plant runs around 80 to 82. Part of his work is underground, where he has to look after two 75 horsepower motors which drive one crusher; one 125 horsepower motor driving a crusher; two 75 horsepower motors driving pumps; five storage battery locomotives and various apparatus in connection with the signalling system.

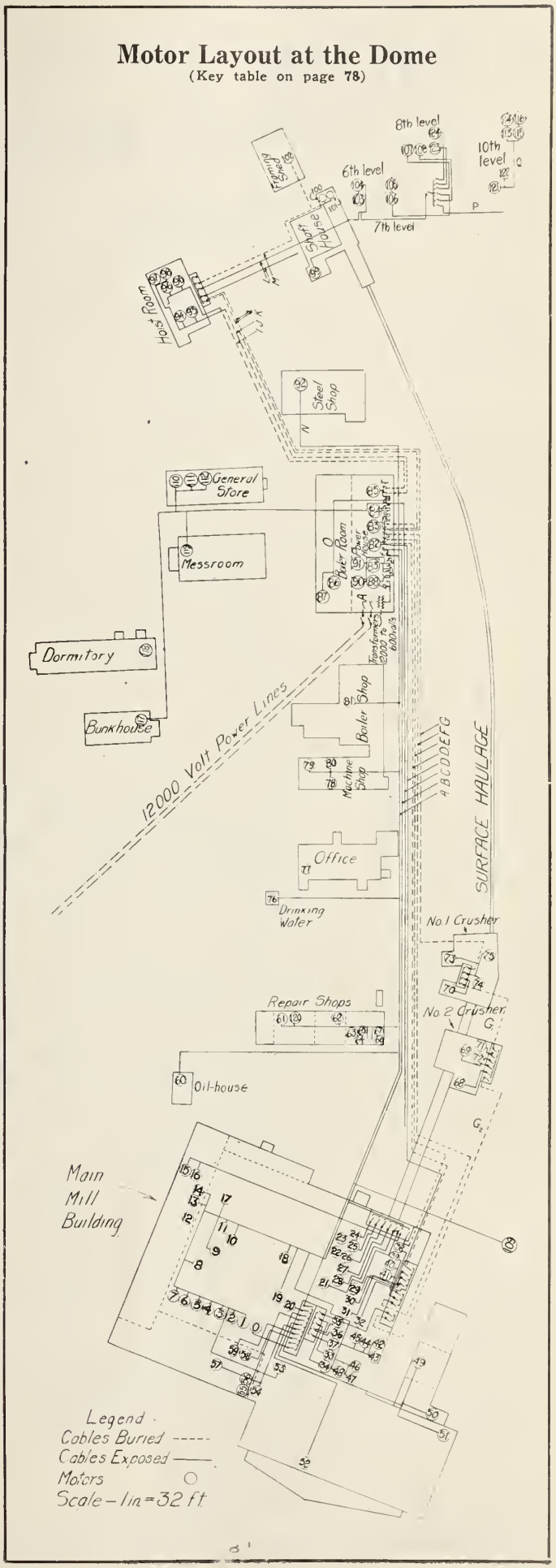
New Marcy Mills for the Hollinger

In connection with the extensions now going on at Hollinger Mine, and the additional equipment that is being installed to increase capacity, the new rod mills which have been ordered are worthy of special mention. These machines, known as Marcy Rod Mills, designed by the Mine & Smelter Supply Company, of Denver, are being manufactured in Canada by the William Hamilton Company, Limited, of Peterboro, Ont. The first installation includes five of these mills which are 6′ 6″ inside diameter, and 15′ long. Five of them are on order and four have been already shipped. The body or drum is of cast iron in three sections, bolted together, and is driven by a large steel cut spur gear 16″ face, around the centre. The drum revolves on chrome steel tires on steel rollers and any thrust is taken care of by means of



Mill assembled at William Hamilton plant

vertical roller thrust bearings. The drums at Hollinger Mine will have belt drive although these rod mills can be designed for direct motor drive. The crushing is done by means of long steel rods 3/4″ diameter, and the capacity of these mills will be 1000 tons every 24 hours. The drum revolves at a speed of 15 r.p.m., and will take 200 h.p. to drive. Inside the drum are special hard iron shell liners, and manganese steel discharge liners, and the total weight of one of these mills complete with the liners is approximately 90 tons. All bearings will have forced feed lubrication, and the drive gears will run in a bath of oil. When installed each rod mill will replace forty stamps now in use. They will be the means of bringing Hollinger's output up to 5000 tons of ore per 24 hours.



Motors in Large Gold Mines

A Table Showing Complete Motor Equipment of the Big Dome Mine

No.	H.P.	Volts	R.P.M.	Location
0	75	550	500	Gould Pump
1	10	"	750	Triplex Solution
2	10	"	750	" "
3	20	"	710	" "
4	5	"	750	" "
5	40	"	750	" "
6	25	"	750	Gould Pump
7	25	"	750	" "
8	30	"	750	Vacuum Solution
9	5	"	750	Zinc Feed
10	3	"	700	Zinc Barrel
11	3	"	750	Emery Wheel
12	5	"	750	Slime Tailings
13	30	"	750	" " W
14	30	"	750	" " E
15	75	"	500	Sluicing Pump
16	60	"	750	" "
17	5	"	750	Residue Thickener
18	25	"	750	Wash Pump
19	5	"	750	Slime Thickener
20	30	"	750	Slime Elevator
21	7.5	"	700	Primary Classifier
22	7.5	"	750	Tube Mill Sump
23	5	"	750	Sluicing Bar
24	100	"	500	No. 1 Tube Mill
25	100	"	500	No. 2 " "
26	100	"	500	No 3 " "
27	100	"	500	No. 4 " "
28	75	"	500	No. 5 " "
29	125	"	500	No. 3 Ball Mill
30	125	"	500	No. 4 " "
31	125	"	500	No 5 " "
32	10	"	750	Ball Mill Feed
33	100	"	500	No. 6 Regrind Tube
34	100	"	500	No 7 " "
35	7.5	"	750	Secondary Classifier
36	20	"	750	Regrinding Pump
37	20	"	750	" "
38	75	"	500	No. 1 Stamp
39	40	"	500	No. 2 "
40	75	"	500	No. 3 "
41	40	"	500	No 4 "
42	30	"	750	Main Conveyor Belt
43	5	"	750	Secondard Tromm'l
44	5	"	700	Shuttle Belt S
45	5	"	700	" " N
46	10	"	750	Slime Elevator
47	10	"	750	" "
48	5	"	700	Mech. Agitator
49	7.5	"	750	Refinery
50	15	"	750	Assay Office
51	10	"	750	Amalgam Barrel
52	75	"	500	Sands disposal
53	5	"	750	Prec. Vacuum Pump
54	5	"	750	Lime Mixer
55				
56				
57	5	"	750	Wooden Thickener
58	100	"	500	No. 1 Robeson Pump
59	100	"	500	No. 2 " "
60	3	"	750	Oil House Pump
61	25	"	500	Carpenter Shop
62	7 5	"	750	Pipe Shop
63	2	"	1400	Electric Shop Emery Wheel
64	2	"	750	Electric Shop Lathe
65	2	"	750	Electric Shop Drillpress
66	.22 kw.	25	1425	Elec. Shop Motor Gener'or
67	½	500	1425	" " " "
68	75	550	750	Incline Hoist
69	25	"	750	Trommel
70	125	"	500	Crusher Big
71	40	"	500	Jaw Crusher No. 1
72	40	"	500	" " No. 2
73	75	"	500	Gyratory Crusher
74	20	"	750	Short Conveyor Belt
75	7.5	"	700	Crusher Feed
76	5	"	750	Drinking water
77	5	"	750	Vac. Pump Warehouse
78	5	"	750	Mach. Shop Planer
79	20	"	750	Mach. Shop line Shaft
80	¾	"	1400	Mach. Shop Drill
81	25	"	500	Boiler Shop
82	450	"	250	No. 1 B&M Compressor
83	450	"	250	No. 2 " "
84	450	"	250	No. 3 " "
85	150	"	500	No 4 Rand Compressor
86	200	"	500	Mill Compressor
87	15	"	750	Circ. Pump
88		600	167	No. 1 Generator
89		600	167	No. 2 "
90	23	120	525	No. 1 Exciter
91	23	120	525	No. 2 "
92	3	"	750	Steel Shop Emery
93	200	"	500	Man Hoist
94	2	"	750	Man Hoist Pump
95	350	"	485	Rock Hoist
96	2	550	715	Rock Hoist Pump
97	1	"	750	Hoist Oil Accumulator
98	1	"	750	" " "
99	30	"	750	Mine Exhaust Fan
100	5	"	700	Hd. frame Ore bins
101	35	"	750	Surface Haulage
102	10	"	750	Framing Shed
103	20 kw.	140	730	DC Charging Set
104	32	550	710	AC Charging Set
105	25 kw.	110	750	DC Charging Set
106	30		750	AC Charging Set
107	75	"	500	8th level Pump
108	75	"	750	" " "
109	25	"	720	Simpson Lake Pump
110	3	"	1400	Refrigerator
111	3	"	1400	"
112	2	"	750	Sausage Machine
113	7.5 kw.	125	1450	DC Charging Set
114	12	550	1450	AC Charging Set
115	7.5 kw.	125	1450	DC Charging Set
116	12	550	1450	AC Charging Set
117	5	"	750	New Bunk House
118	5	"	750	New Dormitory
119	3	110/220	1500	Potato Peeler
120	1.75	110/220	1440	Elliot Woodworker
121	15	550	500	Pump 10th level
122	7.5	"	1500	Blower 10th level
123	75	"	500	Crusher 8th level
124	75	"	500	" " "
125	25	"	500	Spare
126	100	"	500	"
127	40	"	500	"
128	7.5	"	720	"
129	25	"	1500	"
130	125	"	500	"
131	25	"	750	"
132	5	"	750	"
133	10	"	750	"
134	15	"	750	"
135	7.5	"	1400	"
136	10	"	700	"
137	75	"	500	"
138	25	"	750	"
139	5	"	750	"
140	30	"	750	"
141	10	"	750	"
142	15	"	750	"
143	250	"	480	"

Application of Electric Drive in Canada's Mining Industry

Motor Drive a Big Factor in Development— The Ideal Form of Power

By F. A. McLEAN*

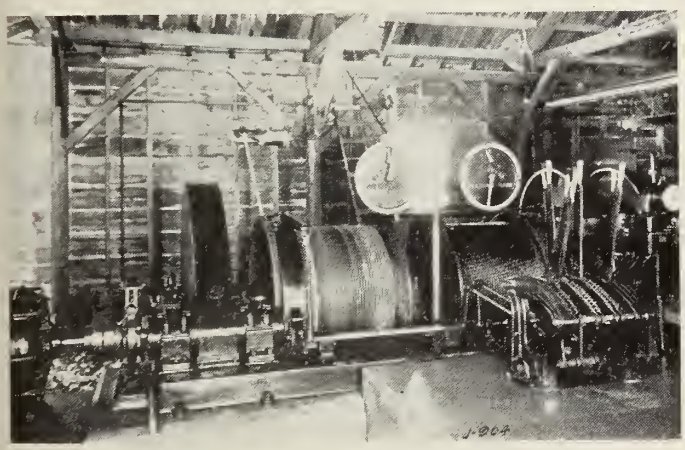
The rapid development of hydro-electric plants in the vicinity of Canada's mining centres within the past few years has led to the increased use of motor drive for many of the most important pieces of mining and mill equipment such as crushers, hoists, compressors, screens and so on.

The ease and cheapness with which electric power may be transmitted, once the lines are installed, the convenience of control, cleanliness and in many cases its economy also, often makes it an ideal form of power for mining and quarrying operations large or small.

Motor-Driven Compressors

For the small mine or quarry, having electric power available, a single stage or two stage straight line compressor with short belt motor drive attachment or a convertible steam driven unit is the most common type of plant selected.

Where a little more air is required a two stage duplex compressor with short belt drive attachment is generally installed. One Canadian built machine of this type delivering about 700 cu. ft. of free air per minute is equipped with a rigid cast iron sub-base which permits the machine to be handled as a single unit. This particular plant has proved very attractive to contractors and mining men due to the readiness with which it may be move dabout.



Double parallel drum electric hoist at Sylvanite Gold Mines

The short belt drive has a number of advantages such as greater arc of contact on belt wheel and motor pulley, less wear and tear on belt, smaller pull on bearings, less strain on working parts than where the long belt drive is used. The very substantial saving in floor space is a feature which is usually appreciated.

Another advantage of this type of drive is that standard motors may be used. Thus, if the compressor is moved from one point to another where different electrical conditions exist it does not entail much delay to change motors, and the old motor, being ot standard commercial design finds a ready sale.

The advantages of the direct-connected electric motor driven compressor are well recognized and included higher mechanical efficiency; elimination of belting and belt pull on bearings; fewer bearings and less bearing friction; compact, self-contained construction; smaller floor space and consequently smaller foundations and building. Direct-connected compressors are built for capacities from 700 to 10,000 cubic feet per minute, and even smaller units will probably soon be available.

Control of Motor Drive Compressors

Complexity and high cost of variable speed motors has made it practically essential to use constant speed motors for air compressor drive. This condition calls for an efficient and reliable method of regulating the air output capacity with the compressor operating at constant speed. Therefore, the question of proper regulation of the complete unit must not only include the demand for varying air requirements, but also the effect of sudden surges in the electric service lines. The essentials requisite for the successful operation of such a regulator for high-speed compressors are as follows:

First, underload regulation must be obtained with such economy that the reduction in power required will be in proportoin to the reduction in output capacity.

Second, all mechanism for regulating the compressor must be independent of the compressor running gear, otherwise the timing of the regulator as the regulation varies is difficult to accomplish.

Third, the unloading and loading of the compressor should be automatically accomplished in steps with the difference between any two steps small enough to prevent undue fluctuation in the electric current.

Fourth, the regulator should be so designed that when the compressor is called upon for average operation at partial load capacity the regulator can be adjusted by hand to limit the maximum capacity. This hand regulation permits the compressor to operate at higher average capacity or higher load factor as compared to the maximum demand than would otherwise be possible. This is a valuable feature where electric power is purchased under a special maximum demand charge.

Automatic Clearance Control

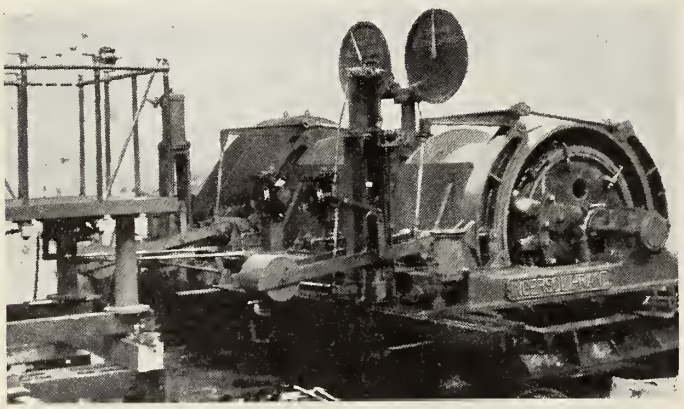
Various types of regulators to meet these conditions have been introduced by the different manufacturers of air compressors. Probably the best known

*Canadian Ingersoll-Rand Company.

methods are a patented 5-step automatic clearance control used on large machines and the more recently developed three-step free air unloaders for use on machines of fourteen inch stroke and under. Both of these methods of control meet the requirements outlined in the foregoing paragraphs and are used on belt-driven as well as direct-connected motor driven types.

A valuable feature of the automatic clearance control is that the clearance pockets are integral parts of the cylinder and the entire regulation is obtained by the control of the volume of air compressed during the period that the air is in the cylinder. With this method there is no loss due to leakage either on the inlet or discharge of the compressor, and it is well known that such leakage has been a serious source of loss in nearly all other forms of regulation used. The pockets in the cylinder are automatically thrown into communication with the ends of each air cylinder in proper succession, the process being controlled by a predetermined variation in receiver pressure. Regulation is obtained in five steps, viz.: full load, three-quarter load, one-half load, one-quarter load and no load.

In purchasing electric power the consumer usually pays a maximum demand or service charge based on the indicated or integrated peak. It is of course to the user's advantage to maintain at all times the highest possible load factor and it is here that the clearance control demonstrates its greatest value. If it should be found that the compressor is operating a great part of its time at less than full rated load, the maximum demand stop can be set for three-quarter or one-half load as may be most favorable, making a corresponding saving in the maximum demand



Large hoist for Coniages Newray. Uses pneumatically operated brakes and cluches, hydro pneumatic motor control

charge. This feature naturally is also often taken advantage of when installing a compressor of greater capacity than called for by present requirements, to provide for future growth.

Free Air Unloader

The free air unloader is a device for economically regulating the capacity of a constant speed compressor by holding open the inlet valves, thus allowing the air to blow freely out of the cylinder without being compressed. Each inlet valve is provided with an air-operated plunger by which it may be held open. The movement of these plungers is controlled by operating valve, which is connected by a small pipe in the air receiver. The operating valve may be set to unload the machine at any desired pressure and pick up the load again when the pressure drops a few pounds, the amount of drop being also subject to adjustment.

Combined Steam and Motor Drive

In many of the Ontario mines steam is used as the motive power until such time as conditions permit changing over to electric drive and for this reason most Canadian built steam driven compressors are so designed as to permit rapid conversion to motor drive when desired. An added advantage of this type of machine is that if the boiler plant is retained it is a very simple matter to use steam for standby purposes in case of shortage of waterpower or temporary interruption of electric power supply for some other reason.

In the case of the new plants where coal is costly or where it is undesirable to keep up a boiler plant the modern multi-cylinder gasoline or oil engine is usually the best type of prime mover to use for standby purposes.

Electric Hoists

Many mines have found it profitable to change over from steam to electric drive for the operation of hoisting machinery or to install electrically driven equipment in the first place. This tendency has been particularly noticeable in Northern Ontario and the majority of the larger mines now use one or more modern motor-driven hoists.

Where alternating current is available, a wound rotor, slip ring type, induction motor is generally used. This type of motor has a practically constant speed under all conditions of load. Its speed, may be lowered, however, by inserting resistance in the rotor circuit, at which time the speed will vary with the load and the amount of resistance inserted in the rotor circuit.

When direct current is used the motors may be of the series, shunt or compound wound types. The latter type is more often used, however, particularly when the load is likely to vary or when close speed regulation is necessary.

The compound wound motor combines the high starting torque of the series wound motor with the constant speed characteristics of the shunt wound type and the no load full speed can be held to 150% of the full load full speed. With the compound wound motor therefore, variation in speed due to load variation is not objectionable.

Electric Hoist Control Systems

Small hoists, equipped with low voltage, alternating current motors can be controlled by means of an ordinary drum type controller. With this type of controller, the motor is started with resistance in the rotor circuit and with each successive step a part of the resistance is cut out until the rotor circuit is short-circuited through the controller and the motor attains its maximum speed. The direction of rotation can also be changed by the controller which reverses the leads of the primary or line circuit.

Where the primary voltage or current is too high to be handled successfully by the drum type controller alone and when the use of full magnetic control is not warranted, it is customary to use semi-magnetic control. With this method the primary circuit is controlled by magnetic reversing contactors operated in conjunction with a drum controller and the necessary resistance. The primary contacts on this drum controller act as a master switch, and

the secondary drum contacts control the secondary circuits of the motor. Over-load and low-voltage protection are provided and over-travel protection can be secured by the use of suitable limit switches.

Full magnetic contactor controllers as used on larger hoists not only start, stop, reverse, and control the speed of the motor, but also provide automatic acceleration, low-voltage and overload-protection. In connection with limit switches they will also provide slow-down, emergency-stop and overtravel protection.

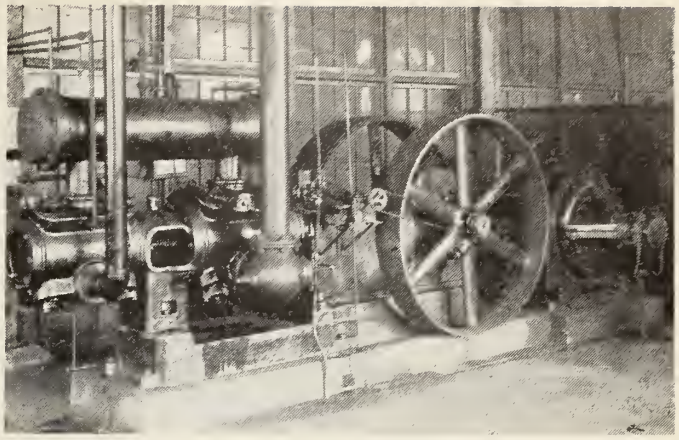
Complete control of the motor is obtained by the operation of a drum master switch. This switch is of small size and easy to operate. It may also be placed some distance from the control panel if desired. The master switch handles only the small control current for the magnetic contactors which open and close the main motor circuit.

With this system the operator has control over the speed of the hoist except that it is impossible to accelerate the load too rapidly if the master switch is thrown quickly from the off to the full speed position. This feature is obtained by the accelerating relays which make it impossible for successive contactors to close until the motor current falls below a predetermined point, and hence, they prevent excessive currents, and consequent jerks and strains on the equipment.

The selection of electric hoist motors and controllers requires considerable engineering skill if the best results are to be obtained and it is impossible to cover such an important subject in an article of this kind.

Motor Driven Pumps

Motor driven centrifugal pumps of various types have been widely adopted for mine and smelter service in recent years. The direct-connected motor driven multi-stage type has superseded to a large extent the reciprocating plunger pumps formerly used for underground pumping stations. The head per stage in modern turbine pumps ranges from 95 to 230 ft. and when pumps of this class are required for very high heads it is possible to operate them in series. In this way capacities of from 125 to 11,000 g.p.m. up to 1400 feet or more can be obtained.



Two-stage straight line compressor with short belt motor drive, a type widely used for development work, opening up prospects, etc.

Due to the simplicity and reliability of such units they are ideal for use in isolated locations or where but little attention can be given to them.

Motor driven equipment has probably been more widely applied in Canadian industries in proportion to population and relative number of plants operating than in most countries. With the advent of larger hydro-electric power developments in Northern Ontario the mines of Northern Ontario are becoming as widely known for the extensive use of electrically driven equipment as they are for richness and rapidity of development.

Many Coal Mines Operate Electrically Decreasing Costs and Hazards

Modern Installation of Canadian Collieries, B.C. —Electrical Equipment Saves $8,000 per Month

Electricity has been used in coal mining back to the earliest inception and development of electrical equipment. It is used for signalling, lighting, communication, motive power and for many special purposes. Its use has tended to economy and efficiency in coal mining and has also lessened the hazard to life and property. Just as in other parts of the world, however, coal mines in British Columbia may be found with most antiquated plant, operated with no apparent regard for economy or efficiency.

Canadian Collieries Plant Modernized

When the Canadian Collieries (Dunsmuir) Limited, succeeded to the control of the mines now owned by them, it was decided to completely rehabilitate the plant and equipment of the mines if tonnage output were to be maintained or increased with any degree of efficiency.

A central power plant was decided on as most economical and on account of higher efficiency in transmission and greater flexibility in operation. A water power of ample capacity and suitable for hydro-electric development was also available conveniently located. Estimated initial cost of hydro-electric plant seemed higher than a central steam plant, but maintenance being so much lower the former was decided on. After more than eight years' operation estimated operating and maintenance cost has not been exceeded. With the old plant, power had been generated by steam in hand fired boilers of various sizes, description and ages. Every mine has its separate plant. There were four mines then being operated and it was desired to open a fifth.

Hydro-Electric Installation at Comox

What was finally decided on was a hydro-electric development on the Puntledge River at the outlet of Comox Lake. The features are a 300-foot concrete impounding dam at the outlet of the lake, a diversion dam on the river a mile below the impounding dam, a canal 330 feet long, a simicircular wood stave flume, 2,200 feet long and a concrete lined ditch leading to

the forebay. From the forebay a 5,400 foot wood stave pipe 8 feet in diameter carries the water towards the power house. A reinforced concrete wye receives the end of the 8-ft. pipe and two 6-foot openings provided with gate valves lead from the wye.

The power house is a substantial concrete structure 120 x 130 feet with a 3-storey wing 50 x 20 feet. The present installation comprises two Escher-Wyss Francis turbines of 6,000-h.p. each, and two C. G. E. 4,400-kw. generators direct connected, with 50-kw. 125-volt exciters.

Transmission System is Complete Ring

A total of about 35 miles of 3-wire, 3-phase transmission lines is in use. The transmission system forms a complete ring with excxeption of a line to Union Bay. Sub-stations are located at each mine and at Union Bay. A double 3-phase, 3 wire circuit leaves the power house for No. 7 mine. From that sub-station a single circuit is carried to No. 4 mine, thence to No. 5 mine. From No. 5 a double circuit is carried to No. 8 mine, and from this latter sub-station a double circuit pole line is carried back to the power house and a single circuit to Union Bay.

The sub-station buildings at all the lines are uniform in arrangement and design, though not in capacity. In every case accommodation is provided for housing, mine hoisting and other equipment as well as the electrical plant. This eliminates a sub-station attendant.

How Mines Are Equipped

A typical installation in one of the mines is of interest. The hoist designed for working at the 700-ft., and 1,000-ft. levels, has a capacity of 2,070 tons in eight hours. The winding motor has a maximum of 1,400-h.p., the average load being 750-h.p. and is direct connected to the hoisting drum shaft. The two conical drums are controlled by compressed air



Generating plant of Canadian Colleries Ltd.—a most attractive exterior

operated clutch and brake engines and the levers are interlocking. Car haul drums are also fitted on the hoist to move empty cars on the tipple back to the caging level. The control levers of the hoists cannot be operated unless there is sufficient pressure. The operating levers are also locked unless full supply of electric power is available.

The motor-generator set consist of three machines, motor, control dynamo, and exciter all direct coupled and mounted on a common bedplate, and operating at 740-r.p.m. The complete electrical equipment of the Ward-Leonard control system is in three parts; winding motor, motor generator set, control gear. The speed at which the wnding motor runs is independent of the load being hoisted. This system of control is ideal for high speed shaft hoisting.



Motor driven hoisting equipment—Canadian Collieries, Dunsmuir

Other equipment installed at this mine includes an all-steel tipple and head frame. In the tipple two pairs of Marcus screens and picking tables were installed, driven by 440-volt induction motors.

A large number of Sullivan chain coal cutters of both wall and short wall type are used. They are operated by 440-volt, 25-cycle induction motors, started by a delta star controller. The usual type of pump in the mine is a bronze turbine, 7-stage, pumping against 800 feet head, the discharge pipe rising vertically through a borehole to the surface. Some of the pumps are 9-stage working against 1,100 feet head. The type of hoist used underground is single drum, clutch operated reduction geared. The motors are slip ring in heavy steel case, very heavy and extremely rugged. They work at 440-volts. The controller is oil immersed to prevent sparking. In every possible way danger from fire is guarded against by this and other special devices. Storage battery locomotives are used on the underground tramways and for charging these, charging stations are located conveniently.

Comparing the electrical equipment of these mines with the discarded aggregation steam plant, there are some interesting figures. No coal is now consumed except for railroad locomotives. There were 30 steam boilers, fired by 42 firemen, average payroll $2,000 per month. Allowing $2.00 per ton for the coal used, the total cost of steam was $10,000 per month, not including supplies and maintenance. Present average operating and maintenance cost (1922) is less than $2,000 per month. In each case no account is taken of interest charges on investment in plant.

The use of chain drives for driving pebble mills, and other mining machinery, is quite general, Morse silent chain drives are seen in many cases.

Electrolytic Refining Plays Part in Nickel Industry

British American Nickel Company Uses Process to Separate Metals From Matte—Flexibility Prime Requisite of Electric Equipment

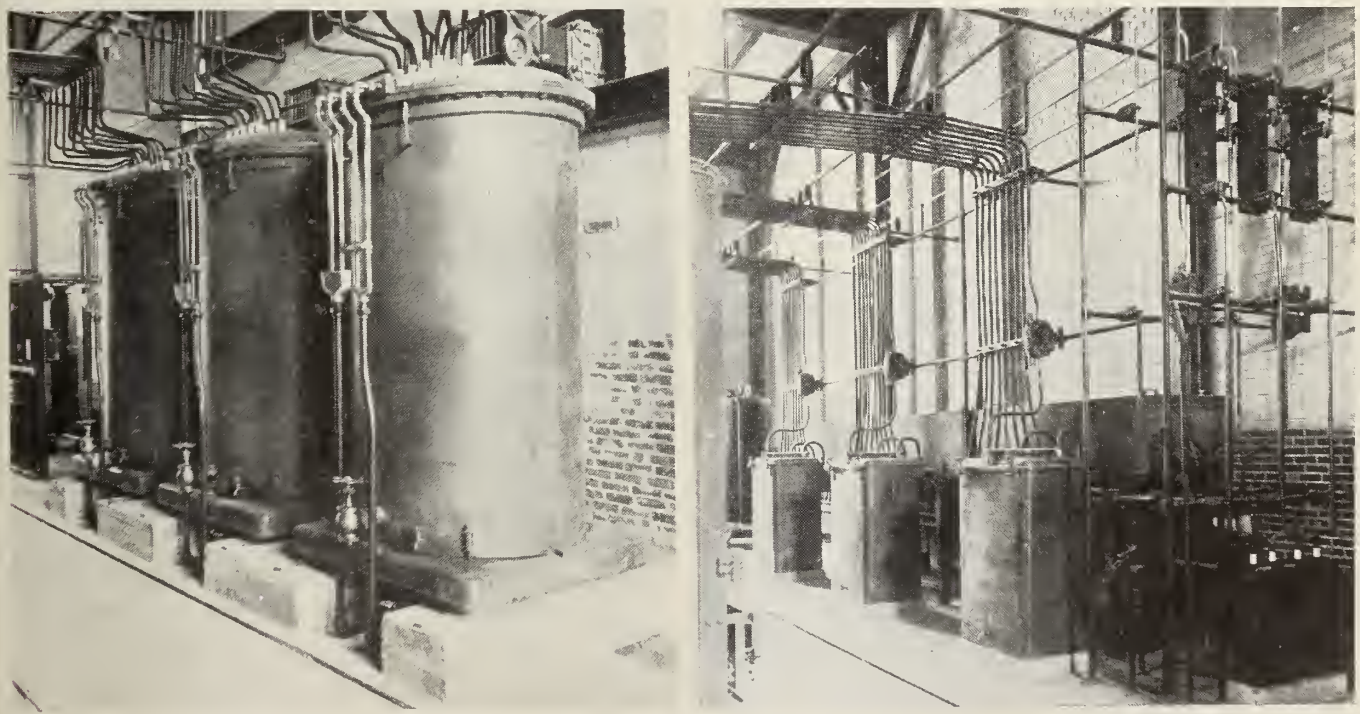
By J. L. McK. YARDLEY
General Engineer, Westinghouse Electric & Manufacturing Company

The chief sources of nickel in the past have been New Caledonia, Oceania, and Ontario, Can. A much smaller production has been mined in Norway. Of the world's probably normal requirements—90 to 100 million pounds of metallic nickel per year, 85 per cent has been supplied by the deposits near Sudbury, Canada.

In the ores of the Sudbury district the nickel is associated with copper, there averaging about 3 1/4 per cent of the former and 1.7 per cent of the latter. Recently, three large companies have been operating in this district and while the metallurgy generally reported as being employed by all up to the point of obtaining the high grade matte has been essentially the same, the separation of the materials from the matte has been effected by three separate and dissimilar processes. The most recent development has employed leaching of the matte and electrolysis to separate and refine the nickel and copper. This process was installed in the plant of the British American Nickel Company.

In this process the Bessemerized matte received in granulated form is roasted to remove the bulk of the sulphur and leached with 10 per cent solution of sulphuric acid, whereby a large proportion of the copper with very little of the nickel is dissolved out. The residue is melted and cast into anodes carrying a high percentage of nickel, some sulphur, a few per cent of copper and a little iron. This melting is performed in a three-phase electric furnace, having a capacity around 60 tons of anodes a day. Each phase is supplied by a 1,000 kv.a. 60-cycle transformer. The 3,000 kv.a. transformer bank is shown in Fig. 1. The heavy current secondary leads pass through the brick wall into the furnace room. Since considerable voltage range and control of voltage is desirable for this furnace, a number of taps are provided on the 12,000 volt primary windings of the transformers and regulating equipment as shown in Fig. 2, is provided so as to give a voltage range for each furnace electrode to neutral of from 38 to 70 volts in nine steps. There are three motor-operated oil circuit breaker type regulators in the rear, with sheet covers over the mechanism, three balance coils, one in front of each regulator, and regulator control switchboard to the left. Each regulator consists essentially of a number of

(Concluded on page 85)



Left—3,000 kv.a. transformer bank supplying current to electric furnace; right—regulating equipment giving furnace a voltage range from 38 to 70 volts





Left—A general view of the devlopment; right, transformers being loaded on scows at Elk Lake

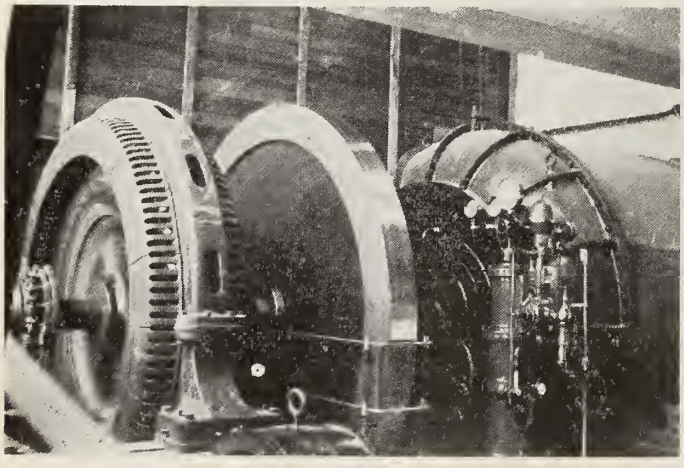
Indian Chutes Hydro-Electric Plant Means More Power for Mines

New Development on Montreal River by Great Northern Power Company Includes Latest Construction Ideas—Power Goes to Porcupine

The Indian Chutes plant of the Great Northern Power Company is located on the Montreal River, 12 miles above Elk Lake. The original falls had a head of 20 feet, but with controlled water elevation a head of 48 feet is now obtained. The average low water flow is 450 to 500 c.f.s., the greatest flood discharge recorded 11,500. Ample provision has been made for flood conditions in the construction, the sluicing having a discharge capacity of 30,000 c.f.s., a safety factor of over 100 per cent.

The isolated situation of the power site necessitated the building of sidings and docks, where the T. & N. O. passes closes to Elk Lake. For the transportation of equipment 3 scows of 40 tons capacity each, were used. These were hauled up the 12 miles to the site by gasoline boats. At Indian Chutes there were also constructed a dock and tramway, the tramway car having capacity to handle the heaviest machinery. The construction included an inclined trestle, a hoist being used to haul the car up from the scow. The cement shed and concrete plant are located at the head of the hill at end of tramway.

Camp construction included the building of cookery and bunk camps for 150 men, water system and fire protection with a 3,000 gallon wood stave tank on a 40 foot tower. The pumping plant consists of 2 steam driven duplex pumps, one 200 g.p.m. and one 100 g.p.m. These had a big job during the fire of 1922. With 1000 feet of hose and 100 men working they saved the camp.



Turbine and generator just installed

Construction Work

The concrete plant for the job consisted of a one cu. yd. Smith cement mixer, and one 120 ft. tower. All the concrete in the dam and headworks was put in by chutes, after being hoisted up tower. The sand and rock bins discharged directly into mixer. At the power house there was a separate concrete plant for the ½ yd. mixer, where a 50 foot tower was used. All earth excavation was taken out by a derrick and clam shell bucket of one cubic yard capacity. All the sand required for concrete was excavated by derrick and clam, swung on main tramway, and dumped into bin at mixer. Drilling on rock was all done with an Ingersoll-Rand 43 fitted for steam. The concrete in the headworks was all poured in December and January. The backs of the forms were housed with tarpaulins and heated with live steam. All the rock excavation in the pipe line cut was hauled to the head works on cars and dumped into the rock fill dam by the derrick on top of headworks. All the rock necessary to complete dam and headworks was dumped in this way. Hoist from headwork picked up skips and dropped them direct into dam.

The construction of a new river channel was one of the most striking pieces of work on the job. In order to wash out the new river channel a small ditch was dug through, below and in front of dam, and when river rose by blocking old channel with rock fill, sluiceways were opened and water used to wash new channel down to bedrock. Approximately 100,000 cubic yards were washed out in five hours.

Power house construction is of reinforced concrete, gypsum slab roof, steel sash, concrete floor. A 15 ton hand operated travelling crane is used. It rests on a rock foundation.

The flume is a wood stave pipe, of B. C. fir, nine feet inside diameter, 412 feet long. It is laid in a cut through the rock, and is made big enough for the ultimate capacity of three lines, 3500 yards of rock being excavated.

The generating equipment so far installed consists of one 2200 volt Canadian Westinghouse generator, of 1800 kv.a. capacity at 80% power factor. This is driven by a Boving double runner horizontal turbine.

Regulation is obtained by a twelve ton flywheel riding betwen the turbine and generator. There are three, 2200 to 66000 volt, step-up transformers of Canadian Westinghouse manufacture. C. G. E. oxide film lightning arrestors are used.

Transmission

The transmission line consists of one 3-phase 66,000 volt, aluminum steel-cored line, carried on wooden poles with 200 feet as the ordinary span. Pin type porcelain insulators are used, consisting of one pole-top pin, and two cross-arm pins. Hardware was supplied by the N. Slater Co., and a large part of the insulators by Canadian Porcelain Co.



The transmission line of steel-cored aluminum.

A distributing station at South Porcupine steps voltage down to 12,000, for distribution to the mines. There are three single phase, 100 kv.a. self cooled, oil insulated transformers there, protected by C. G. E. oxide film arresters. The 12,000 volt lines have Westinghouse electrolytic arresters. A line runs to the Peninsular Mines at Night Hawk Lake, where Crocker-Wheeler transformers are used to step voltage down. A Northern Electric Company telephone system is used along the line.

The entire design and construction was carried out by Sutcliffe and Neelands, of New Liskeard, Mr. T. S. Armstrong being resident engineer.

Contract Placed for Largest Electrically Operated Coal Hoist in World

The largest coal mining hoist in the world will be installed at Orient No. 2 mine of the Chicago, Wilmington and Franklin Coal Company at West Frankport, Ill. A contract for this hoist has been awarded to the Westinghouse Electric and Manufacturing Company and the Nordberg Manufacturing Company. The capacity of the hoist motors of the Orient No. 2 hoist will be 4,400 horsepower divided in two motors, one mounted at each end of the drum shaft and each having a capacity of 2,200 horsepower at 40 degrees centigrade rise. Coal will be hoisted in skips at the Orient mine, each skip having a normal capacity of 22,000 pounds and a maximum capacity of 26,000 pounds. The depth of the shaft is 607 feet and the coal is dumped from the mine at the bottom of the shaft by means of rotary dumps.

Electrolytic Refining in Nickel Industry

(Continued from page 83)

single-pole 12,000-volt circuit breakers operated through cams and connected to the high tension taps of one of the furnace transformers. The motors driving these regulators are controlled by relays on the switchboard and operate the breakers so as to keep as nearly as possible a constant kv.a. input to each electrode. Power-factor is from 70 to 90 per cent depending on the voltage, approximately 900 kw.h. a ton.

The solution from the roasted matte containing several per cent of copper, is electrolyzed for copper, employing insoluble anodes. The electrolyzed solution, depleted in copper, but strong in sulphuric acid, is returned to the leaching plant to dissolve more copper from the roasted matte.

The approximate 65 per cent nickel anodes from the electric furnace plant are treated in separate electrolytic tank room. The anodes are contained in special canvas bag diaphragms to catch the anode slime containing precious metals and are electrolyzed in a solution containing four to five per cent of nickel and but a small fraction of a per cent of commer. Electrolysis, of course, while reducing the nickel, increases the copper; and the solution is piped to cementation vats where, in place of the scrap iron ordinarily employed in the cementation of copper, waste and scrap anodes are used, and at the same time that copper is precipitated, nickel is re-supplied to the solution, making it ready again for electrolysis. The amount of waste anodes obtained during the electrodeposition of nickel is said to be about sufficient for the purpose of rejuvenating the exhausted solution from the nickel tanks and it is stated that the solutions never require to be thrown away as the cementation purifes them sufficiently.

In regard to the electrical equipment fo rthe electrolytic plant this must contain a great degree of flexibility. Synchronous booster rotary converters should be employed, as the efficiency would be constant within one-half per cent over the normal operating and a saving of five per cent in the total power consumed in the electrolytic plant would be effected over that consumed by employing motor generator sets.

The electrolytic equipment as worked out by the Nickel Company's engineers, the Westinghouse Electric & Manufacturing Company and the Canadian Westinghouse Company, consists of five duplicate units, four for nickel and one for copper in usual operation, each composed essentially of:

Synchronous booster rotary converter, having a maximum continuous capacity of 1,160 kw., 290 volts, 4,000 amperes and a normal operating range of 230 to 290 volts—supplied by three 400 kv.a., 11,000-volt, 60-cycle transformers, having 8-turn secondaries tapped out to switches in such manner as to permit any one of six voltages being impressed upon the rotary converter and thus give it a total practically continuous range in voltage of from 50 to 290 volts.

In 1921, there were over 2,700 electric motors used for mining purposes in Canada, with an aggregate capacity of over 157,000 horsepower.

Sturgeon Falls Plant, Northern Canada Power Ltd.

Augment's North's Power Resources

Over 8000 Horsepower Available From New Development on Mattagami River—Interesting Construction Details

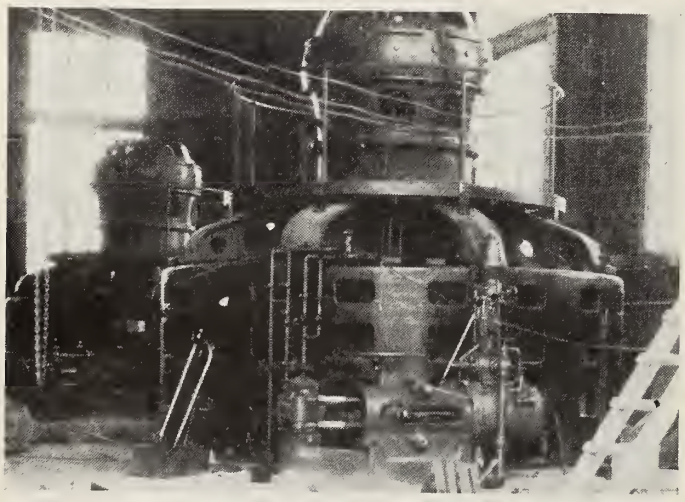
Northern Ontario's hydro-electric resources are still further augmented by the Sturgeon Falls plant of Northern Canada Power Limited, which has just been completed. This development is tied in with the Sandy Falls and Wawaitin Stations of the same company, at the Timmins sub-station, thus providing a three-fold source of energy for customers.

The plant is located at Sturgeon Falls on the Mattagami River, a distance of about 30 miles northwest



Power house, looking downstream (under construction)

from Timmins. Advantage was taken in the design of the presence of an island, and the actual work was found to fit in very nicely with anticipations. The dam is of concrete, combination Ogee and pier type, about 500 feet long. Construction was carried out along the usual lines, first the unwatering of the



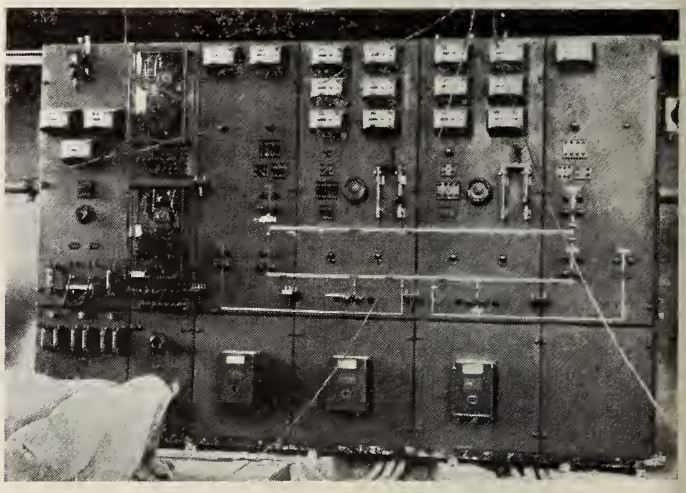
The two C.G.E. generators (before installation was complete)

main channel, through the provision of temporary sluiceways, and then the power house excavation, followed by the concrete work. A one yard mixer was used and crushing was done by a No. 6 Austen machine. All work was elevated to a bin above the mixer. Concrete was put in by chutes from an elevated truck. Practically the entire power house was built in the winter time, steam being used for heating. During construction a temporary tie-in was made with the Sandy Falls plant for the small amount of power necessary.

As the plant is comparatively isolated, the transportation of heavy machinery to the site was a considerable job. It was accomplished by using scows from Timmins. These carried the parts to the site of the Sandy Falls plant. Here a mile portage was necessary, and the heavy pieces were dragged on skids. Scows completed the trip to the site. Arrived there, the final effort was to get them up the hill to the power house, accomplished by a strong block and tackle.

Power House Machinery

The available head of 47 feet is utilized by two I. P. Morris turbines, made by the Dominion Engin-



Main switchboard (before installation was complete

eering Works. These are of the vertical type, 4000 h.p. each at 42 ft. head, though considerably more power is obtained at the 46 or 47 foot head available. These are supplied by Moody draft tubes, and regulation is secured by Woodward governors.

Generators were supplied by the Canadian General Electric Company and are each of 4000 kv.a. capacity. Current is generated at 25 cycles, 23,000 volts. Tirrill regulators are used. The exciters are directly connected, each is of 58 kw. capacity.

The step-up for transmission purposes is accomplished by two C .G. E. transformers. These step current up to 44,000 volts. The low tension bus is located directly behind the switchboard. This supplied current for the station pumps, and for local use.

The low tension floor is located just above the switchboard and carried switches, disconnects and instrument transformers. An emergency 125 volt Exide

storage battery is also placed here. This can be used to operate control switches and emergency lights at switchboard. The top gallery constitutes the high tension floor. A high voltage oil switch, C. G. E., 400 ampere capacity, is located here, also station transformers, choke coil, and C. G. E. oxide film arrester.

Transmission is by a No. 2 solid copper line, strung on wood poles, 135 foot normal span. The line to Timmins will ultimately be doubled, each gen-



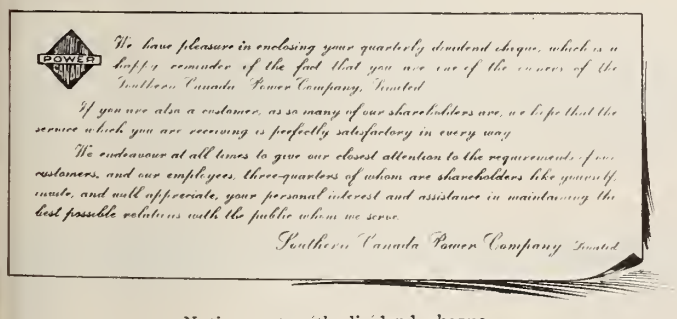
One of the transformers (before installation was complete)

erator and its line forming a unit, the tie-in being accomplished at the Timmins sub-station. Wishbone type crossarms are used, supplied by the N. Slater Company.

Credit for the design is due to Viele, Blackwell and Buck, consulting engineers.

Southern Canada Power Builds Goodwill

A method of building good will among the shareholders of central station company debentures is illustrated by the accompanying reproduction of a notice which is sent out by the Southern Canada Power Company. This notice is sent with all divid-



We have pleasure in enclosing your quarterly dividend cheque, which is a happy reminder of the fact that you are one of the owners of the Southern Canada Power Company, Limited.

If you are also a customer, as so many of our shareholders are, we hope that the service which you are receiving is perfectly satisfactory in every way.

We endeavour at all times to give our closest attention to the requirements of our customers, and our employees, three-quarters of whom are shareholders like yourself, invite, and will appreciate, your personal interest and assistance in maintaining the best possible relations with the public whom we serve.

Southern Canada Power Company Limited

Notice sent with dividend cheques

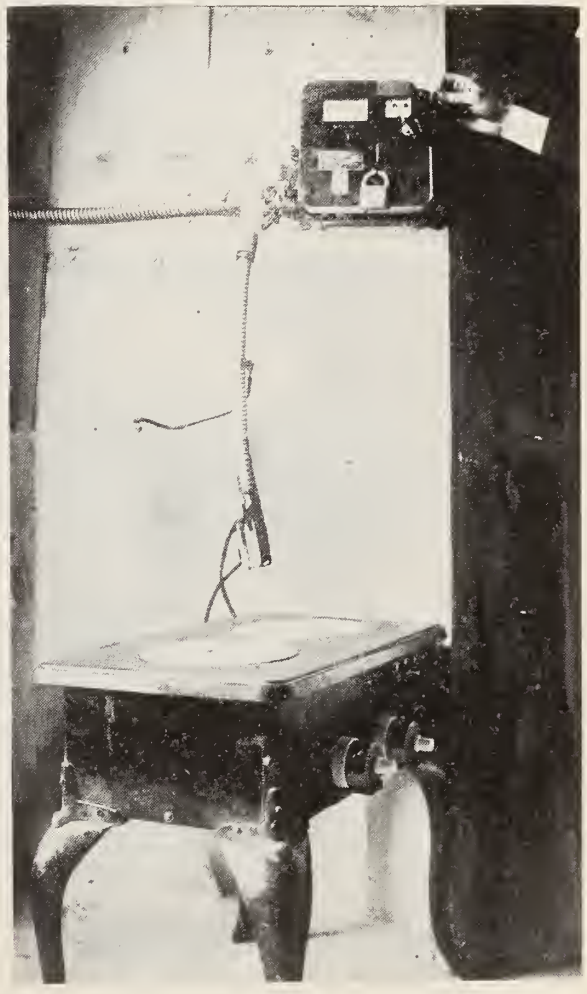
end cheques and as will be noted carried with it a message of courtesy and good will. An interesting fact will be noted in the text of the message, i.e., that three quarters of the employees of the company are shareholders. It is also pointed out that many of the customers are also shareholders. This seems to be in line with modern tendencies and a strong feature in building up good will for the central station.

Quarter-in-Slot Electric Meter Sells Current to Tourists

An idea that would appear to have many applications in other localities, has been recently tried out by the Public Utilities Commission of London, Ontario. The plan is to make an electric stove available to tourists through a quarter-in-the-slot meter. The plan is described by Mr. E. V. Buchanan as follows:

In London we have an automobile tourist camp which is provided with electric light, water supply, swimming pool and accessories.

"In the kitchen shed, in addition to a wood stove, we have a two-burner electric stove connected through a "quarter-in-the-slot" meter. The meter has been geared so that the rate charged is 15c per kw.h. —this will give enough current to use both burners



How the "tourist" stove is hooked up

on "high" for half an hour, both on "medium" for one hour, and both on "low" for two hours, or any other arrangement in proportion. A pin is placed in both switches so that the switches cannot be turned to an "off" position. This practically insures the department obtaining 25c for each use of the stove. If this pin were not used, several meals could probably be cooked with the one coin if the first user shuts the stove off immediately he is finished. "We believe the installation is rather a good advertisement for Hydro, because the caretaker of the camp tells us that practically every tourist is interested.

Newfoundland Power & Paper Co. Award Contracts

The Newfoundland Power & Paper Co. recently awarded contracts to the British Thompson-Houston Company, for the generators for their new hydro-electric system. The Canadian General Electric Company are supplying the transformers to the number of 31, with a total capacity of 170,000 kv.a. This contract was let through the W. G. Armstrong-Whitworth Co., who are general contractors on this development.

A Wonderful Gold Mine

Hollinger is capitalized at $25,000,000 and possesses 600 acres in one block. To date its equipment has cost over $5,253,333. It can treat 4,500 tons of ore a day, and equipment now being installed will raise this figure to 8,000 tons per day. There are over 50 miles of underground workings. Hollinger has some claim to be considered the greatest gold mine in the world.

Accept Tenders for Erection Wireless Station In Canada

A report states that tenders for the erection of a high-power wireless station in Canada have been accepted by the Amalgamated Wireless Limited, of Australia. The cost of each station will be two and a half million dollars. Their sites have not yet been selected, but it is understood that the Canadian station will either be Victoria or Vancouver.

French Prohibit Radio Newspaper

The French Government has prohibited the issuance of a daily "Newspaper" in which the contents were to be transmitted entirely by radio. Preparations had been made for beginning the broadcasting of the "Newspaper" when the Government ban was imposed. Promotors of the scheme intend to bring up the question of the right of publication in the French Chamber of Deputies.

Toronto-Bowmanville Radial

The initial step in the operation of a new radial line, which will run from Bowmanville to Toronto, was taken on Oct. 31 when Mayor R. M. Bassett of Whitby drove in the first spike on the track to be laid by the Toronto Eastern Railway. Construction was first commenced in 1914 by the Canadian Northern Railway. Originally tracks on the proposed radial were laid from Bowmanville to Whitby, and grading on the right of way was completed from Whitby to Pickering; but the rails on the latter part were not laid. Nothing further was done on the work, and last December Sir Henry Thornton, President of the Canadian National Railways, announced that he would have the road extended to Toronto and operated as a fast electric railway.

Directors of C.G.E. Approve Sale

The directors of the Canadian General Electric Company, Limited, at a meeting held in the head offices on Oct. 24, decided to accept the offer of the General Electric Company, of Schenectady, New York, for control.

Montreal Electrical Luncheon

On Oct. 24, E. B. Myers, of the Myers Valve Company, was the guest of the Electrical Club of Montreal at their luncheon at the Queen's Hotel. He gave a talk on "The Use of Valves in Radio."

B.C. Electric Company

British Columbia Electric Railway Company, Limited, reports total gross earnings in August, 1923, at $855,551, an increase of $13,277 over the corresponding month last year, when the total was $842,274.

BARGAINS

2 British-make Diesel Oil Engines—one 465 Brake H.P. and one 184 Brake H.P., fine condition. Also Railway Generators, 275 and 125 K.W.

Moose Jaw Electric Railway Company, Moose Jaw, Sask., or Ottawa. 20-23

BUSINESS CHANCES

are best found by reading the Constructional Activity pages of the CONTRACT RECORD AND ENGINEERING REVIEW each week. Advance information on hundreds of buildings, homes, factories, etc., in every issue gives you an opportunity of writing or calling upon men who you know to be in the market for wiring and electrical devices. Subscribe today. Only $3.00 per year. Contract Record, 349 Adelaide St. West, Toronto. 13T.f.

FOR SALE

10,000 (series) Christmas Lamps, colored flowers and animals; 2,500 Sets miniature Pear Shape Lamps assorted colors (8 in series, 112 volts) wired with sockets and cords complete; 10,000 Miners' Lamp Bulbs 2.6V. Very special price and terms to clear. Direct Supply Association, Ltd., Victoria, B. C. 17-22

FOR SALE

1—Fairbanks-Morse Duplex Piston Pump, 100 U. S. gals. per minute capacity. Suitable to pump to 125 lbs. pressure, driven by 1—10 H. P., 550 volt—3 Phase Motor. Mounted on same bed plate and connected by gear to pump. 1—Westinghouse Automatic Starter (Pressure Controlled) for same. Elmira Public Utilities Commission, Elmira, Ont. 20-24-1

POSITION VACANT

Electrical designer wanted, thoroughly experienced on high voltage water power stations. State experience and references to Box 408, Electrical News, Toronto. 21-22

AGENCIES WANTED

Manufacturers' Agents in Winnipeg desire one or two more good lines for wholesale trade. Box 372, Electrical News, Toronto. 18-23

Retail Marketing Tips

Washing Machines

—And How to Sell Them

Dig Out That List To-day

It's Time to Cash in

Now is the time to realize on prospects. If you have been holding up that list of names you got at the fall fair, dig it out to-day.

There's a reason. Electric washers are moving. Here is what W. H. Flewwelling, Toronto manager, Onward Manufacturing Company, says:

"Things are good right now. We got all kinds of prospects at the fair, and now we are cashing in. Of course we don't follow up every name on the list. It is hard to draw the dividing line between likely buyers and curiosity seekers but we try to cut out useless calls, while not omitting any possible chance of a sale.

"We follow the plan of having the salesman call first with catalogue. He arranges for a demonstration on the housewife's regular washing day. Then we stage a real demonstration, and in most cases we are able to sell the washer, because we believe in it ourselves.

"Every machine we place brings us other business, because we see to it that the buyer is thoroughly satisfied, and likes the machine so well she boosts it to her friends."

"The wise ones are out chasing business now—"



There's an Electric Washer to Suit Every Prospect in the Famous Connor Line



Connor Perfection Electric Swinging Wringer

Connor Electric Washers built in four different models, meet every demand. They are the result of long years of experience in washer and wringer building. Every washer guaranteed. Look at the prices, a good profit for dealer shown, get our trade discounts.

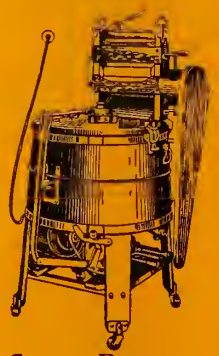
See This New One

MODEL 4C

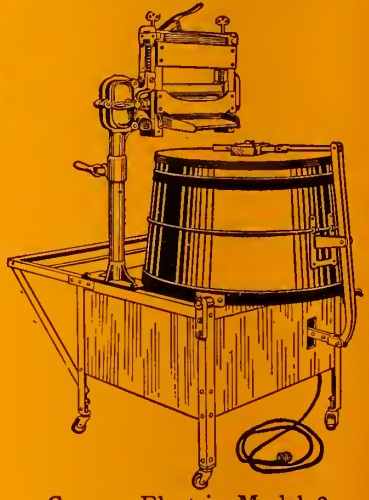
This latest addition to our line is filling a long-felt want. It possesses many special features—polished copper tub and polished aluminum cover, polished aluminum feed board and drain board of 12" swinging wringer, extension folding bench —these and many other special devices make an instant appeal.



The Connor Copper Tub Model 4C



Connor Economy Stationary Wringer



Connor Electric Model 2 Wood Tilting Tub Swinging Wringer

Mr. Dealer-- Ninety-Five out of One Hundred women you talk to, in your store or through your ads., use the dolly type hand or water power washer. When you show them the Connor four winged dolly, they know, from experience, you are right. Why not recognize the advantages of our four, different, models operating on same principle, meeting the buying ability of different people.

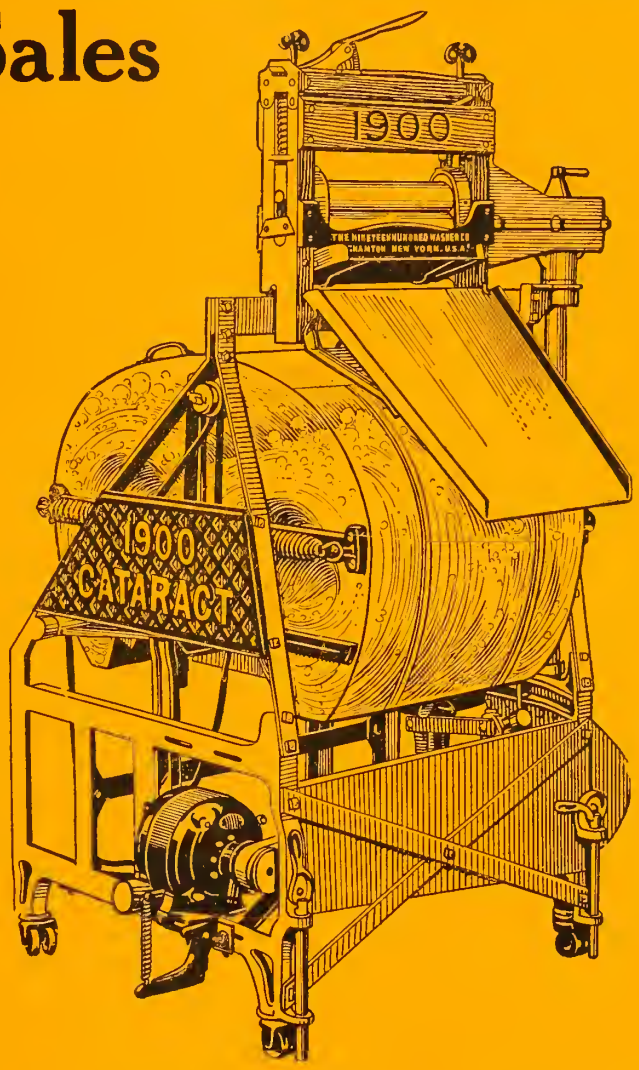
J. H. Connor & Son Ltd., Ottawa, Ont.

311 Chambers St., Winnipeg, Man.

Wind up the Year with Some Worth-While Sales

You can do it with the

"1900" CATARACT WASHER



Here are the Reasons:

Its ingenious and thorough method of washing clothes gives the "1900" Cataract Washer a direct appeal to a woman's desire.

It washes clothes in half the time because its powerful motion gives the water wonderful life and vigor, and turns the clothes repeatedly, getting over and under and through them.

Two moving arms, one on each side of tub throw it backwards and forwards giving twice the force. This feature is not to be found on any other washer.

Its advantages are evident and easily demonstrated.

Its principle — "Cataraction" — is mechanically correct and has never been successfully imitated.

We Will Help You

By sales helps, free advertising service to dealers, and close sales co-operation, we will assist you to get buyers for this splendid washer. The "1900" Cataract has made big money for scores of other dealers. Why not you?

Features of the "1900"

Power transmitted from motor mounted on swinging base—by flat endless belt.

Reversible Wringer—shaft driven—adjustable to all required positions for use in connection with two washtubs. Frame—extra heavy—all metal, mounted on casters with 4 adjustable lifting levers.

Tub—solid copper—detachable cover.

Wringer—Rock Maple Frame—extra quality white rubber rolls—all cog wheels enclosed. Equipped with safety release attachment.

Fast moving parts of driving mechanism fully enclosed running in oil.

Motor—Highest Standard of Quality—Special Design ¼ Horse Power.

BEATTY BROS. LIMITED

Head Office Fergus, Ont.

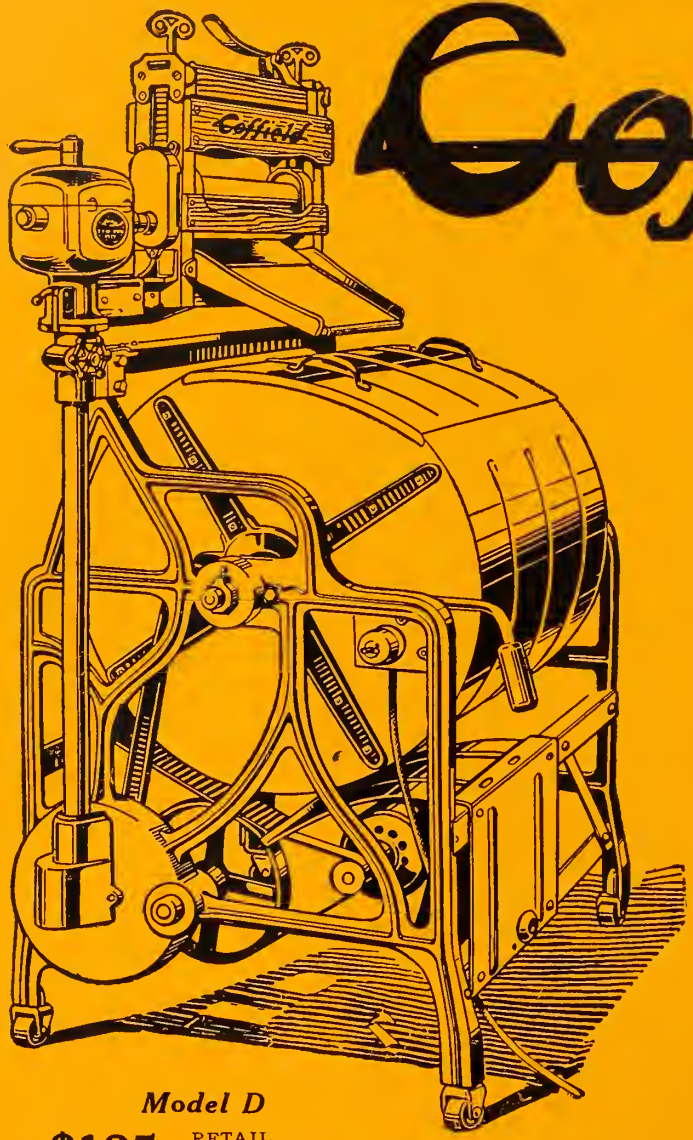
Largest Washer Manufacturers in the British Empire

Branches:

Toronto, London, Montreal, St. John, Winnipeg, Vancouver, Edmonton, London, Eng

Don't Let This Opportunity Pass

We are on the verge of another gift-making season. Christmas again offers the wide-awake dealer opportunities for increased sales. Of the many available electrical gifts to handle what could be more desirable and more profitable for the dealer than a



Coffield ELECTRIC WASHER

"Makes the prettiest, cleanest clothes that ever came out of suds."

Why It Sells—

(1) The Coffield runs quietly, without creeping or vibration.
(2) Chemically treated bearings do not need oiling or adjusting.
(3) Oscillating copper tub, rocks within the frame—leakless, rust-proof and self-cleaning.
(4) Swinging wringer has extra wide rolls. Is instantly reversible because of patented "touch o'thumb" water shutter and stationary drain boards. Locks in eight positions. It will not sag, is easily controlled and perfectly safe.
(5) The Canadian Westinghouse Motor of special enclosed type has ample power, is well protected, yet easily accessible.
(6) Patented clutch operates the Coffield without jar or vibration.
(7) Patented, protected leakless drain swings inside the washer frame. Faucet cannot screw clear out. Empties both sides of tub at once. Spout is threaded for hose attachment.
(8) The Coffield is handsome and graceful with its polished copper tub and aluminum finished, cast iron frame.
(9) The best quality washer and moderately priced.

Model D

$125 RETAIL PRICE IN ONTARIO

$135 IN QUEBEC MARITIMES AND WESTERN PROVINCES.

Note—(The retail price in United States on Model D is $140.00)

Dealers!

The Coffield Washer has made a name throughout Canada for performance, convenience, durability and economy. It is a money maker to the live dealer. We have still some unrepresented territory—why not write now and secure the agency in time for the Christmas turnover. Write us today.

Made in Canada by

The Coffield Washer Co. of Canada Limited

HAMILTON - CANADA

Repeater

TRADE MARK

RADIO PHONE $6 2400 OHMS



Unequaled clearness through new magnetic principle of construction.

Reproduces long distance or local broadcasting without distortion—endorsed by Radio Experts everywhere.

Guaranteed satisfactory or money back.

DEALERS—Write today for discounts and descriptive folder.

Moss-Schury Mfg. Co. Inc.,
Radio Division
2011-2015 Franklin St., Detroit, U.S.A.

Double the Life of Your Pole Lines

By using our
OPEN TANK TREATED

British Columbia Cedar Poles

They afford your pole lines better support, and add considerably to their appearance. Let us send you further particulars and prices No obligation.

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Filer-Smith Machinery Company, Limited,
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Montreal, Que.

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I-T-E Circuit Breakers and U-Re-Lites.
Cutter Elec. & Mfg. Co.,

Hi-Tension Air Break Switching and S & C Fuses
Schweitzer & Conrad, Inc.

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Sundh Electric Co.

Elec. Motors—Robbins & Myers,

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Acme Wire Co.

Rawlplugs—Inventions Ltd., Montreal

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Midwest Canada Ltd.

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D. M. Fraser, Pres., 24 Adelaide St. E., Toronto
Phone Main 6926
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Century

Fractional H.P.
Repulsion Start Induction

SINGLE-PHASE MOTORS



⅛ to ¼ H. P.

have a high starting torque which makes them especially adaptable to drives such as house pumps, household refrigerating compressors, etc.

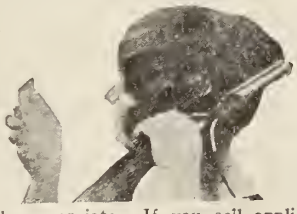
Besides, the brushes touch the commutator only during the starting period. This insures long life and quiet operation.

CENTURY ELECTRIC CO.

1827 Pine Street ST. LOUIS, Mo., U.S.A.

Stock carried in Canada by:
Jones & Moore Electric Co. Ltd., 294 Adelaide St. W., Toronto
Great West Electric Co. Ltd., Winnipeg
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Unsurpassed Holiday Seller—An Appliance Worthy of the Name—Hairwaver, original and practical LE BIJOU HAIRWAVER is an unequalled Holiday gift and is packed in a neat hinged box together with instructions on hairwaving actually worth double the amount. Every woman finds it practical and appropriate. If you sell appliances, you surely can sell the most popular one with the ladies. LE BIJOU HAIRWAVER stays sold and needs no servicing. Nichrome wire is used in the heating elements and the appliance is fully guaranteed. It sells at the popular prices of $3.50, $4.50, $6.50, $7.50, $8.00 and $8.50.

Write today for your order, whether large or small. Liberal discounts are allowed to dealers and jobbers. Show cards, booklets and terms sent on request.

Sold by the best Jobbers and Dealers.

LE BIJOU SPECIALTIES 188 N. LaSalle St. Chicago
Manufacturers of Electrical and Stove Heated Hair Wavers

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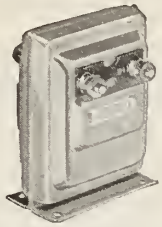
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Type M-6
Aluminum
Shielded



Yours
for
$3.50

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AUDIO AND RADIO FREQUENCY TRANSFORMERS

8 TYPES TO CHOOSE FROM

SATISFACTION GUARANTEED

Radio, Bell-Ringing and Toy Transformer Catalogues Sent Upon Request.

Dongan Electric Mfg. Co.
Transformers of Merit for 14 years
Detroit - - Michigan

You can't afford to take chances on your

INSULATING VARNISHES

"ARMACELL" and "OHMALINE"
(Clear) (Black)

provide COMPLETE protection. There is nothing better.

"PAKYDERM"

a handsome, quick drying, protective insulating finishing coat, black or golden.

Made in England by Griffiths Bros.

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45 St. Alexander Street - Montreal
Ottawa.....J. W. Anderson, Bank St. Chambers
Toronto .....H. A. J. Aldington, 53 Yonge St. Arcade
Winnipeg.....Wm. A. Goold, 39 Charlotte St.
Halifax.....R. P. Power, 311 Royal Bank Building

Motors in Stock

220 Volt, 3 Phase, 25 Cycle

1— 5 HP. Robbins & Myers (New) 1500 rpm Complete

550 Volt, 3 Phase, 25 Cycles

1— 3 HP. Lincoln Elec. Co. 1500 rpm. Complete
1— 5 HP. Swedish G.E. 1500 rpm. "
1—7½ HP. General Electric 750 rpm. "
6—10 HP. Westinghouse Co. 750 rpm. "
4—15 HP. Westinghouse Co. 750 rpm. "
3 20 HP. Westinghouse Co. 750 rpm. "
3—25 HP. General Electric 750 rpm. "
2—30 HP. Crocker Wheeler Co. 750 rpm. "
3—35 HP. General Electric Co. 750 rpm. "
2—50 HP. Crocker Wheeler Co. 750 rpm. "
1—75 HP. Crocker Wheeler Co. 750 rpm. "
1— 75 HP. Can. Westg. 2200 Volt, 550 rpm. "

220 Volt, 3 Phase, 60 Cycles

1—10 HP. Can. Westinghouse (CCL). 1200 rpm. Compelte
1—10 HP. Can. Westinghouse (CCL). 1750 rpm. "
1—300 HP. ACB, 2200 V., 3 ph., 60 cy., 430 rpm., 3 bearing.
1— 1 Kw. Motor Generator Set, 10 Battery capacity, Complete, 60 cycles.

Large stock of new and used single phase 25 and 60 cycle Wagner and Century and Peerless Motors

Transformers

3—750 Kva. Cr. Wh. 3 Phase, O.I.W.C. 13200/2300 Std. Taps
3—500 Kva. Can. Gen. Elec. SP., O.I.S.C. 13200/2300 Std. Tap Outdoor Type.
3—300 Kva. Westg. SP. O.I.S.C. 13200/2300 Std. Taps, Station Type
3—100 Kva. Packard Elec. Co. SP. O.I.W.C. 13200/575 Std. Taps, Station Type.
3— 50 Kva. Crocker Wheeler, 2300/575 Pole Type

Prompt and Reliable Service on:—REPAIRS, REWINDING, REBUILDING, all types and sizes of Motors, Generators and Transformers.

The Sterling Electrical Company
St. Catharines, Ont.
W. Mackenzie E. A. Dodington

Motors in Stock

60 cycle, 2 phase, 220 volt, Second hand Motors

No.	H.P.	Speed	Make
2	1	1800	Westinghouse
3	2	1800	T.H.E.
1	2	1800	Westinghouse
3	5	1800	Westinghouse
1	5	1800	T.H.E.
1	50	2200	Wagner—No starter

60 cycle, 3 phase, 220 volt, Second Hand Motors

1	1	1800	T.H.E.
1	2	1800	C.G.E.
1	2	600	C.G.E.
1	2	1800	Chapman Walker
1	7½	1200	T.H.E.
1	8	1800	T.H.E.
1	15	1800	Crocker Wheeler with Starter complete

25 cycle, 3 phase, 550 volt

1	2	710	Century (new)
1	3	1500	T.H.E. (new)
1	7½	750	T.H.E.
1	10	1400	Imp. Electric with Starter complete.
1	40	710	Westinghouse CCL " " "
6	30	750	Crocker Wheeler " " "
1	15	1450	Westinghouse (new) " " "
1	50	720	Westinghouse H.S. " " "
2	50	750	Crocker Wheeler AQ " " "
3	20	750	Crocker Wheeler " " "

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1	30	720	Westinghouse without starter
1	35	750	T.H.E. with starter complete
1	40	720	C.G.E. with starter complete

Toronto and Hamilton Electric Co., Limited
HAMILTON ONTARIO

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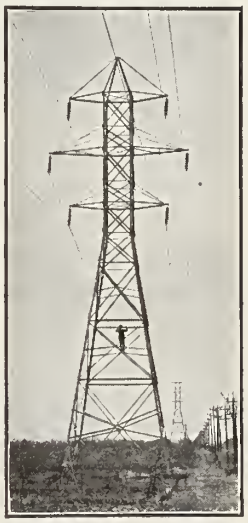
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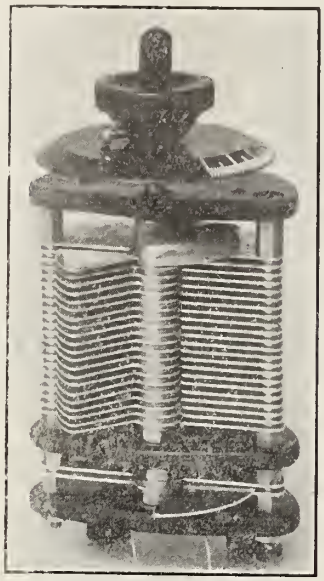
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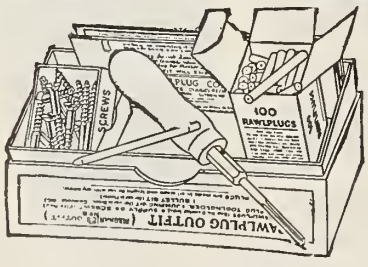
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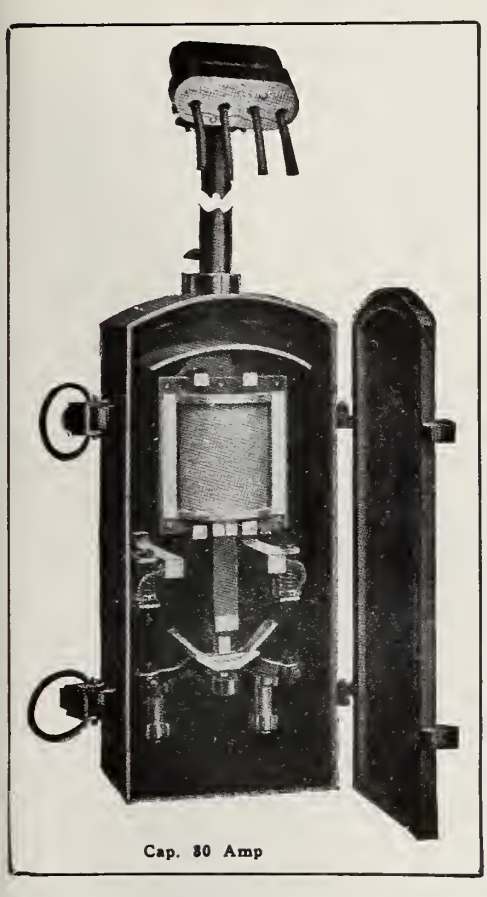


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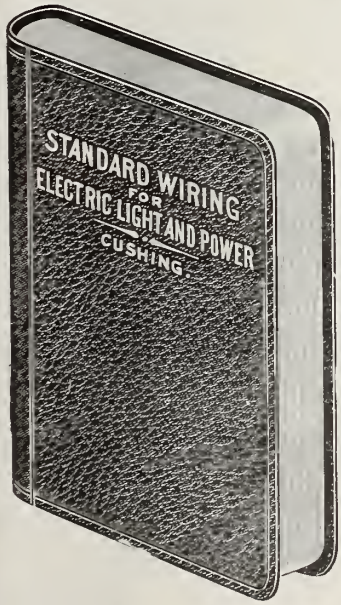
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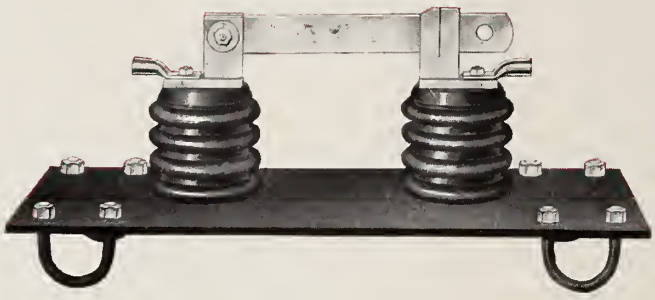
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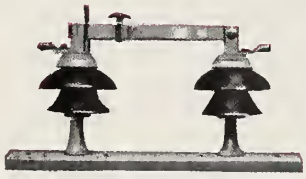
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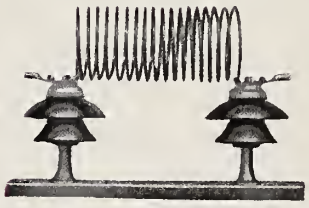
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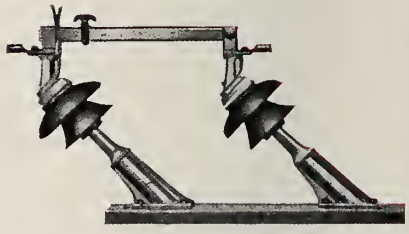
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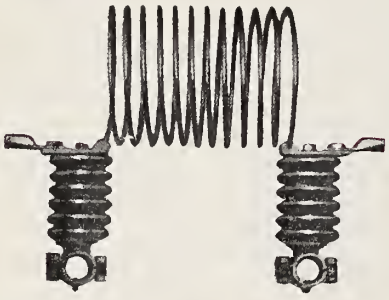
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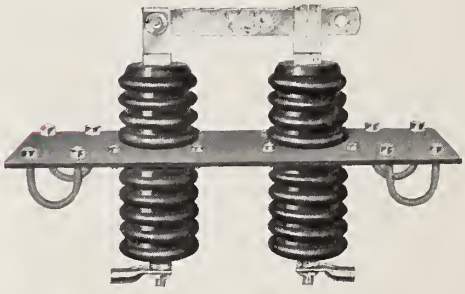


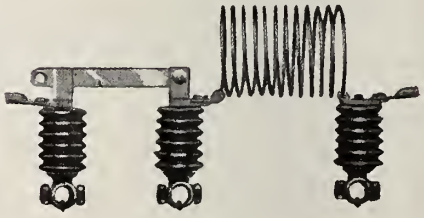


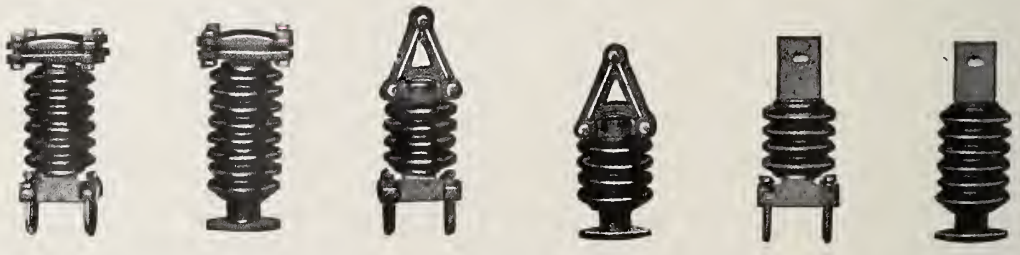












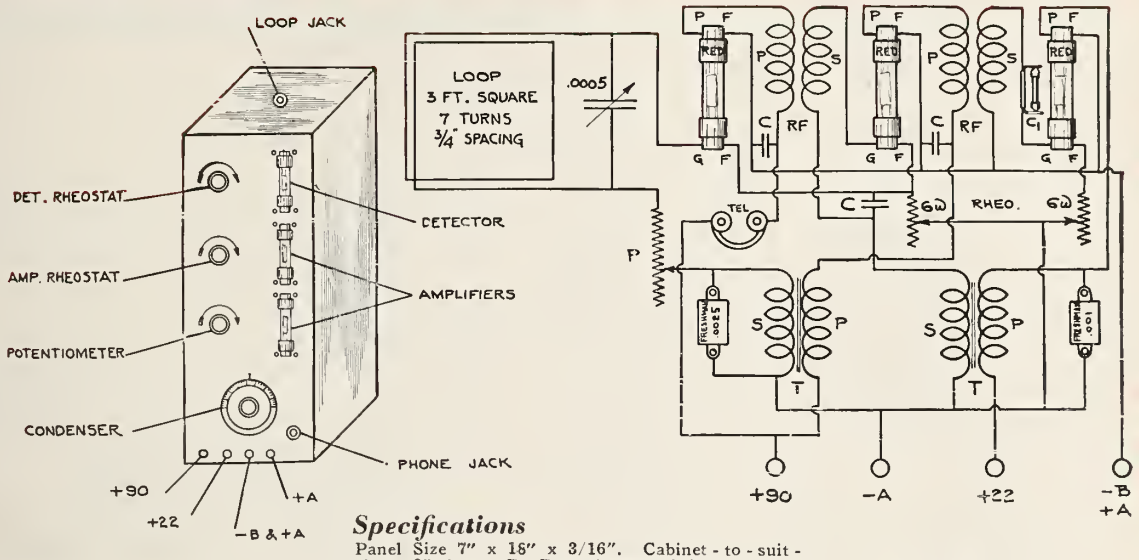
Write for Catalogue No. 10

THE DEVOE ELECTRIC SWITCH COMPANY

MONTREAL TORONTO

Electrical
Engineering Contracting News Merchandising Transportation

The Tube's the Thing!



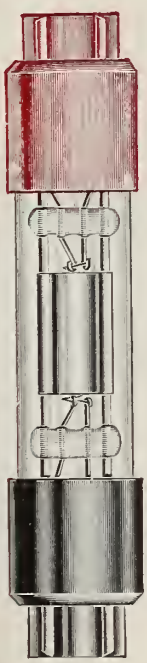
Specifications

Panel Size 7" x 18" x 3/16". Cabinet - to - suit - about 6" deep. P—Potentiometer 400 meg. C—.001 M. F. Fixed Condenser. RF Good R. F. Transforme-. T—Good A. F. Transformer. C—Fixo .00025 1½ Meg.

Show this hook-up to your customers

Here's a proved business-getter for the live wire dealer! Show your customers this Three Tube Circuit—a simple "hook-up" with an unusual range using Myers Dry Cell or Universal Tubes.

Do not confuse these tubes with the ordinary type. The Myers Tube has been designed purely from the standpoint of its requirements as a piece of Radio Equipment. Any radio fan will recognize it as a superior piece of equipment.



Full Size

"IT IS THE BIGGEST LITTLE THING IN RADIO"

F. B. Myers Co. Ltd.
Radio Vacuum Tubes
240 Craig Street W. Telephone Main 7822 **Montreal**

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IT'S A GREAT DETECTOR

as well as an

AMPLIFIER



The Famous

Northern Electric

R215A

Peanut Tube

The Peanut Tube is rugged. Originally designed for Radio use in airplanes, it needs no cushion support.

Operating on a single dry cell battery, its life of 2000 hours means real economy.

For bringing in distant stations it has no equal.

Tell your radio customers these facts and get more business.

DEMAND YOUR SUPPLY

AND

SUPPLY YOUR DEMAND

Manufactured in Canada by

Northern Electric Company

LIMITED

MONTREAL	TORONTO	WINDSOR	CALGARY
HALIFAX	HAMILTON	WINNIPEG	EDMONTON
QUEBEC	LONDON	REGINA	VANCOUVER

"Makers of the Nation's Telephones"

MANUFACTURING

Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and Receiving Equipment

DISTRIBUTING

Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

Dealers apply to nearest branch house for prices and discounts

Removing the Menace of Darkness



INEFFICIENT Lighting in the factory is not alone non-productive of good work, but it is a positive danger. Many thousands of avoidable accidents occur every year in factories and workshops directly due to inefficient lighting. A sure remedy whereby this condition can be permanently removed is by the installation of correctly designed reflectors.

BENJAMIN
Industrial Lighting

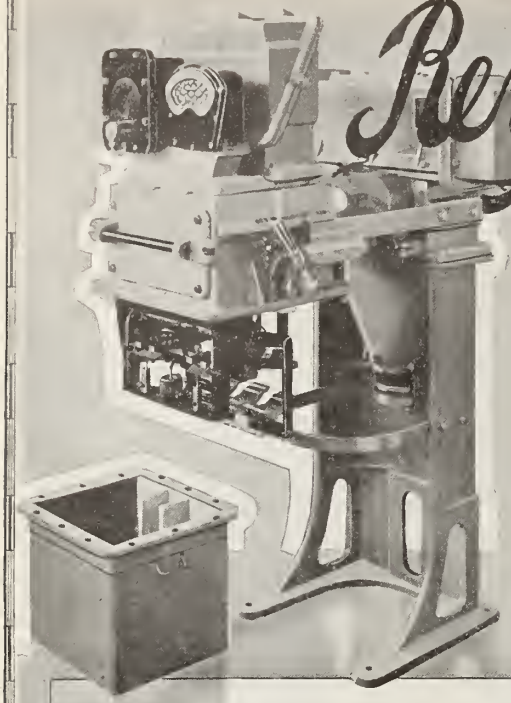
Correct lighting means lower cost through greater production, fewer accidents and less spoilage. On request we will mail you informing literature on the various types of Benjamin Reflectors — Dome R.L.M. — Deep Bowl — Shallow Bowl — Flat Cone and Elliptical Angle Reflectors.

Get in Touch With Us To-day

Benjamin Electric Mfg. Co.
of Canada, Limited
TORONTO
Montreal ***Winnipeg***

Reyrolle company First

NOTWITHSTANDING OTHER CLAIMS.



UNIVERSITY OF SHEFFIELD.

DEPARTMENT OF APPLIED SCIENCE,
ST. GEORGE'S SQUARE,
SHEFFIELD

TELEPHONE 4705.

October 30th 1922.

October 30th 1922.

Certificate No.6.

This is to certify that a typical example of Messrs A.Reyrolle'e Mining Switch Pillar with Potential Transformer Type P, 3300 Volte 200 amps. capacity.

hae been treated ae follows:-

The casing of the apparatue was filled with the moet explosive mixture of firedamp and air (9·5 per cent methane), and this mixture wae ignited by a eecondary discharge from an induction-coil whilst the apparatue, aseembled ae for uee, was eurrounded by a eimilar explosive mixture.

Under these conditione of test flame did not pass from the apparatus to the explosive atmosphere outside, which remained unignited; nor did the apparatue euffer damage due to the preeeure developed within it.

A Stay

Professor of Mining.

UNIVERSITY OF SHEFFIELD.

DEPARTMENT OF APPLIED SCIENCE,
ST. GEORGE'S SQUARE,
SHEFFIELD.

TELEPHONE 4705

October 28th 1922.

Certificate No.5.

Thie is to certify that a typical example of Messrs A. Reyrolle'e Mining Switch, Pillar Type P, for three phaee current, 3300 Volte 400 amps. capacity.

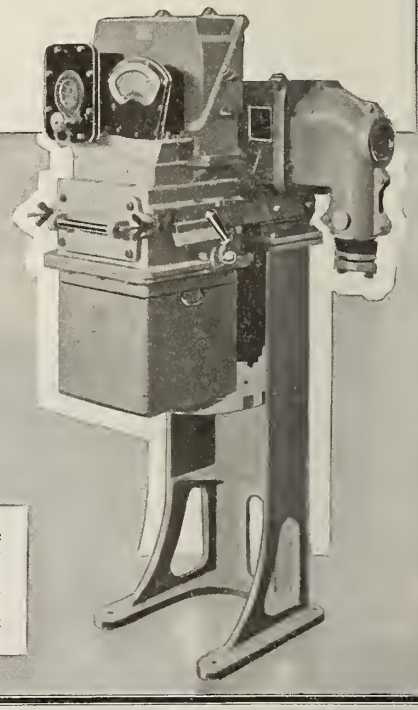
has been treated ae follows:-

The casing of the apparatus was filled with the moet explosive mixture of firedamp and air (9 5 per cent methane), and thie mixture wae ignited by a eecondary diecharge from an induction-coil, whilet the apparatue aesembled ae for use, was surrounded by a similar explosive mixture.

Under these conditione of test flame did not pase from the apparatue to the explosive atmoephere outeide, which remained unignited; nor did the apparatue euffer damage due to the preseure developed within it.

A Stay

Profeseor of Mining.



CERTIFICATE Nos. 5 & 6 are the FIRST of the series issued by the DEPARTMENT of APPLIED SCIENCE, UNIVERSITY of SHEFFIELD FOR DRAWOUT GEAR—They were Reyrolle Pillars as illustrated. Moreover, the FIRST certificate for FLAMEPROOFNESS was also issued to Reyrolle & Co. Ltd. on the 14th August 1922. Moreover Reyrolle & Co. Ltd. were again the FIRST to show the certificate on an advertisement 19/10/22.

A. REYROLLE & Co LTD.

HEBBURN-ON-TYNE ENGLAND.

"There's the Best Panel Made!"



WHEN an amateur radio fan starts out to build his own set he invariably calls in a more experienced friend for the "inside dope." The parts this friend recommends are the parts the new fan will buy. When it comes to the panel, practically any fan will endorse Condensite Celoron.

Why? There are many reasons. In the first place it offers the greatest insulation possible. It is tough, hard and moisture proof. It comes all ready cut in ten standard sizes, and is easily drilled, sawed or tapped. When the instruments are assembled on its lustrous black surface it makes a set any fan is proud to own, and a set that receives with amazing clearness.

In short, Condensite Celoron means satisfaction to the customer—and

More Profits For You

Get your order in now and obtain your share of business while the season is at its height. Indicate by number the sizes you want.

1—6 x 7	5—9 x 14	9—7 x 24
2—7 x 9	6—12 x 14	10—7 x 26
3—7 x 12	7—7 x 18	11—12 x 18
4—7 x 14	8—7 x 21	Thicknesses
		1/8 , 3/16" and 1/4"

Immediate delivery on special cut panels.

Each panel wrapped in glassine paper to protect polished surface. Contains instructions for machining and finishing.

DIAMOND STATE FIBRE CO. OF CANADA LIMITED
Wrigley Bldg., Carlaw Ave., Toronto

CONDENSITE CELORON
STANDARD RADIO PANEL

Packard

Announcing Our New Type S Meter for all Loads Both Single and Polyphase

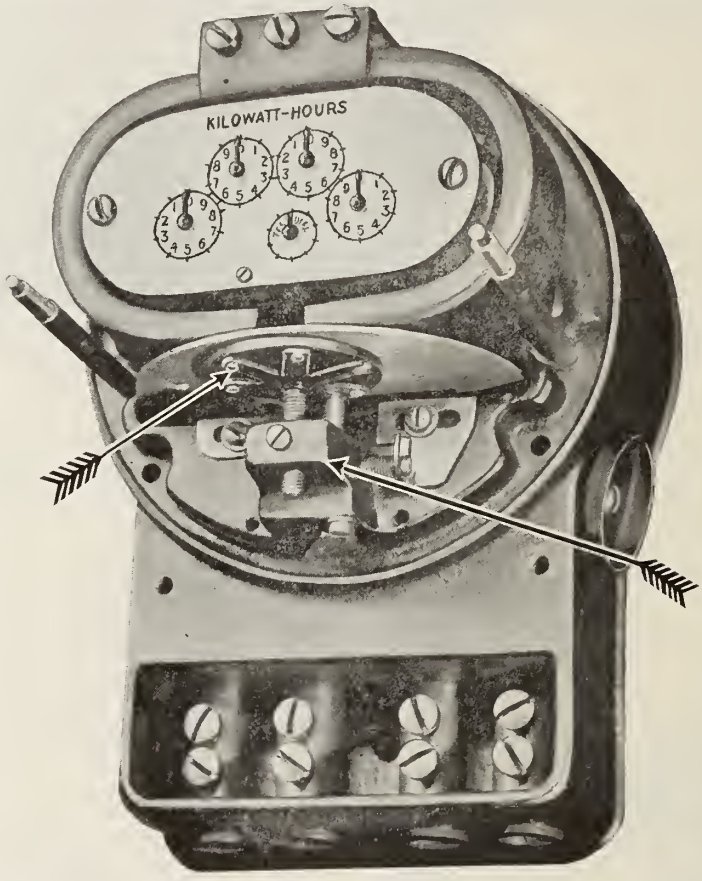
The Only Meter Adjusted for Temperature

Complete Accessibility.

Moving element can be taken out for cleaning—in fact all the various elements can be taken out and reassembled without disturbing calibration.

Automatic temperature adjuster Canadian and U.S. Patents applied for.

Will add from 1 to 2% to the annual revenue, this extra profit will in a short time pay for the meter.



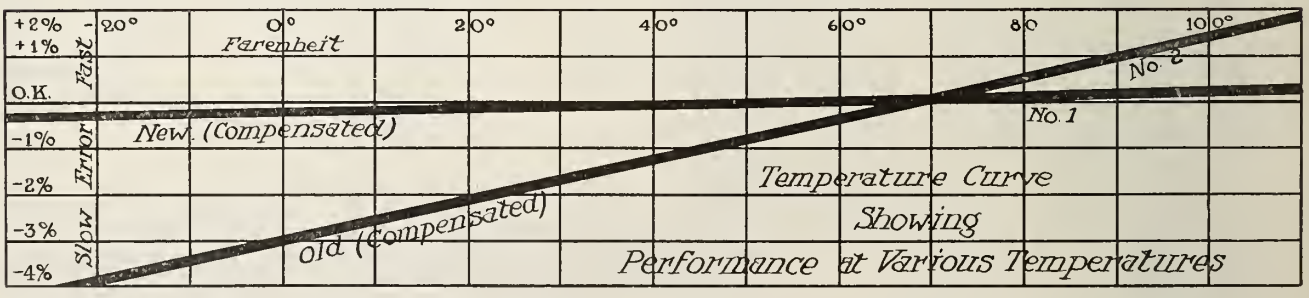
Jewels and ball so arranged as to be dust-proof.

Friction in all moving parts reduced to a minimum.

Torque high as consistent with the best general operation of the meter.

Full and light load screw adjustments for calibration most conveniently located, two screws in all terminals.

We are ready to make prompt shipments.



The Packard Electric Co., Limited

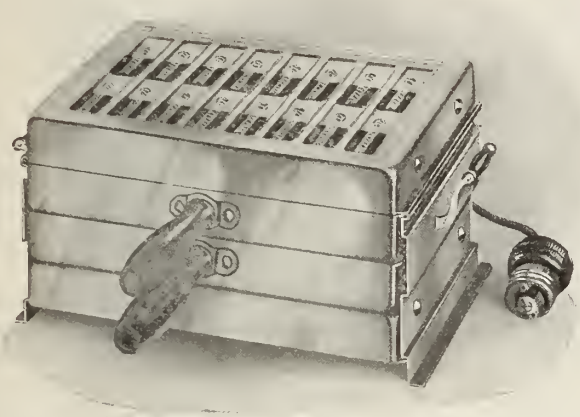
St. Catharines, Ontario

Room 308-9, 7 Adelaide St. W., Toronto **421 Power Building, Montreal**
703 Confederation Life Building, Winnipeg

Agents:

H. M. Hopper, 57 - 59 Dock St., St. John, N. B. J. T. Warren, 738-11th St. West, Calgary, Alta.
Scott Foster & Co., 615 Hastings St. West, Vancouver, B.C.
W. Murdock, Dundonald St., Halifax, N.S.

Big Profits on this Quick Seller



Size 8 x 5½ x 4½, exclusive of handles and terminals. Furnished complete with two full sized grill pans. Each 7¾ x 5½ by 1-in. deep, and cord with separable plug. Operates on any lighting current.

WHITE CROSS

Luncheonette No. 55

At last an Electric Grill that BAKES! In addition to frying, roasting, broiling or stewing as well as any gas or coal range.

Every housewife will be interested. For with the exception of the big Sunday dinner she can prepare every meal, breakfast, luncheons, suppers, from soup to dessert easily and quickly with less exertion. She can place stove beside her and attend to other work or read —no constant getting up to look at cooking.

Prepares ham and eggs, sausage, stews and soups; broils or fries chops and steaks; makes better coffee and toast. AND IT BAKES DELICIOUS, CRISPY, BROWN ROLLS AND BISCUITS at the table! Cooks above and below heating coils at the same time. Cooks on new principle giving more intense heat than old-style grills. Has 4 heats—cooks fast, medium or slow, as desired.

Many of our customers have been asked $12.00 and $15.00 for grills which cannot compare with this one. But you can sell them this grill, which does ALL KINDS OF COOKING—at an amazing low price.

Beautiful also, heavily nickel plated; highly polished; ebony handles. Compels attention wherever displayed. Stops everyone at your show window.

Write for Prices

Write us at once for price. Use the coupon below. We will arrange to send samples to you on approval.

NATIONAL STAMPING & ELECTRIC WORKS
3212-3242 W. Lake St., Chicago, Illnois

National Stamping & Electric Works,
3212-3242 W. Lake St., Chicago, Ill.

Mail at once without obligation, large illustrated circulars of the White-Cross Luncheonette, with special prices.

Name .....

Address .....

City .....

Marconi Radio Offers Real Opportunities to Aggressive Electrical Dealers—

Better broadcasting, greater simplicity, and new low list prices now make every home a real prospect for Marconi Radio.

Complete Sets

$55.00

$57.50

$60.00

$100.00 and $105.00

With each set is supplied our Complete Instruction Booklet which ensures the purchaser of the best that radio offers.

Though the demand is greater than ever we are making prompt deliveries and are in a position to open up a number of new accounts with Electrical Dealers. The trade discounts are attractive and the capital outlay is low.

Many of our most successful agents are in the Electrical business and knew little or nothing about radio a few months ago. Our complete instruction book provides the dealer with all the technical information necessary.

Marconi Radio is now being extensively advertised. If you are out to turn the Fall and Winter months to good account, write now for our dealer proposition.

THE MARCONI WIRELESS TELEGRAPH
COMPANY OF CANADA LIMITED
MONTREAL

MARCONI RADIO

Instruments of Proved Ability and Consistent Performance.

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Rubber Covered Wires and Cables

FOR POWER, LIGHT AND TELEPHONE WORK

Incandescent Lamp Cord, Flexible Switchboard Cables, Special Cords and Cables for all kinds of Electrical Work.

Prompt Shipments from Canadian Factory.

BOSTON INSULATED WIRE & CABLE CO., Limited

Canadian Office and Factory, HAMILTON, ONT.



A Galvaduct Building

Collegiate and Vocational School for Kitchener and Waterloo, Ont.

Architects, S. B. Coon & Son, Toronto. Electrical Contractor, Harris & Marson, Toronto.

"GALVADUCT"

"Galvaduct"

The most perfect interior construction conduit on the market.

Recognized as the standard of high quality.

Always specify Galvaduct or Loricated.

Conduits Company Limited

Head Offices and Factory

Toronto

Western Sales Offices: Winnipeg and Vancouver

"Loricated"

A high-class interior construction conduit of the enamelled type, proof against acid or other corrosive agents.

If your jobber cannot supply you—write us.

"LORICATED"

Secondary Construction of Proved Value

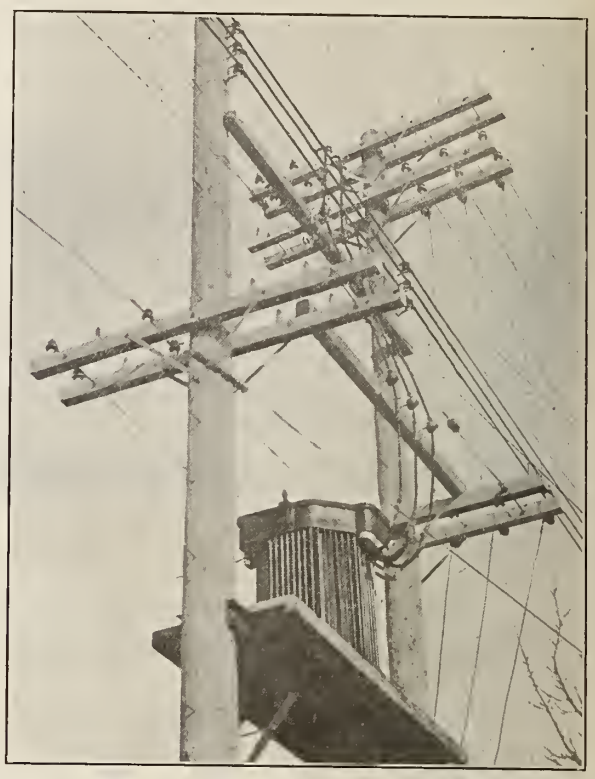
Using Peirce Racks and Brackets.

The Peirce

Racks and brackets conform to every requirement. The Peirce provides the very highest type of pole line hardware known to-day.

One of the foremost electrical engineers has written his experiences and recommendations in rebuilding and modernizing a distribution system.

N. Slater Co., Limited have prepared this work in pamphlet form. Write for your copy.



Method of connecting low hung transformer to secondaries at top of pole—from L. C. Peterman's booklet, "Secondary Construction of Proved Value."

All Peirce pole line hardware is marked with the words "Peirce" and "N. Slater Co., Limited."

It's the quality in the Peirce that protects.

It's the name on the Peirce that safeguards.

Ask your Jobber

N. Slater Co. Limited

Hamilton, Ontario



I-14

Watthour Meters

Ten years of successful service show the I-14 Meter to be as nearly perfect as present day experts in meter design and manufacture can produce. It represents the culmination of a long period of development by the Canadian General Electric Company, which has 35 years of experience in watthour meter building.

Accuracy in Service

THE standard by which a watthour meter should be judged is not its performance under ideal conditions. What is its accuracy under the less favorable conditions such as: inductive loads, varying voltage, frequency or temperature and abnormal wave forms? And will it maintain its initial accuracy indefinitely?

The I-14 Meter fulfills these requirements. Its freedom from the effects of these abnormal conditions and its ability to maintain its high initial accuracy over continued period of service, simplifies the meter problem of the central station.

"Made in Canada"

Canadian General Electric Co., Limited

HEAD OFFICE TORONTO

Branch Offices: Halifax, Sydney, St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

"The Standard by which all other Irons are Judged"



Cat. No. F18

Hotpoint Christmas advertising will appear in the daily papers from coast to coast during December, and will be the means of attracting thousands of people into those dealers' stores, who display "Hotpoint Servants for the Home" in their windows.

"Made in Canada" by

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited

Announcing the New

Hotpoint

Iron

FOR years the Hotpoint Iron has been the leader in its field. Every worth while feature, in iron construction, has been a Hotpoint development.

The Hotpoint Iron was the first iron to truly have a hot point —the first with the flat type of element—the first with the attached heel stand—the first and only iron with a thumb rest—and now the first with the

"Strength Saving Cantilever Handle and Through Bolt"

This new feature marks the latest development in iron construction. The Hotpoint is now more than a leader among irons, it is in a class by itself.

Thousands of Hotpoint Irons are given as Christmas presents every year. This year more than ever will be purchased. It will handsomely repay you to prominently display the new iron in your show windows, and associate yourself with the iron that is "the standard by which all other electric irons are judged."

Orders for new irons will be filled in strict rotation. We strongly recommend you to place your order with your jobber at once.

"Made in Canada" by

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited

Eight out of every ten are Underlighted

STAND in front of your store tonight. Notice the stores to the right and left of you, those across the street, eight out of every ten are underlighted—and in most cases the merchants don't know it.

Many of them will buy good lighting when you point out that poor illumination tends to keep people outside of their doors—makes a store gloomy and actually slows up selling.

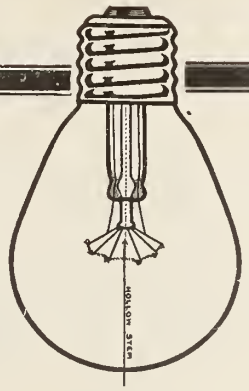
In most cases, unlighted stores have too few lamps or lamps of too low wattage. In some cases, lamps are improperly shaded with the wrong type of glassware. You can correct all these faults, and do your fellow merchants a service, and in addition make a handsome profit at the same time.

OUR advertising campaign has firmly established in the buying public mind, the superiority of Edison Mazda Lamps. If you are already an Edison Mazda Lamp Agent, consult your Blue Book, as to the dates upon which the next advertisment will appear in your local paper, and insert a small "tie-in" advertisement on the same page. If you are not an Edison Mazda Lamp Agent, we have a proposition that will interest you.

EDISON LAMP WORKS

of

Canadian General Electric Co., Limited



The Highest Development in Artificial Illumination

THE development of DALYTE "HOLO-STEM" TIPLESS lamps marks the greatest advance in the art of incandescent lamp manufacture since tungsten alloy metal filaments were produced. But what is probably even more interesting to the dealer is their complete acceptance by the public and the remarkable sale they are enjoying.

So far the surface has only been scratched. There is plenty of opportunity for many more dealers to share the success. There is room for you.

A card will bring you full particulars at no obligation whatever. Do it now.

Head Office and Factory:

DALYTE ELECTRIC LIMITED

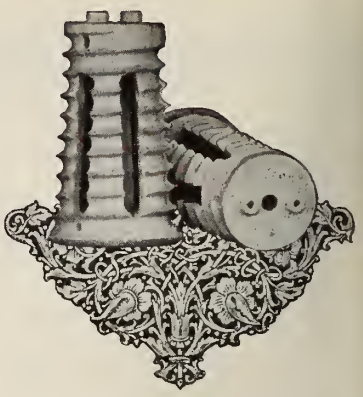
Guelph, Ontario, Canada

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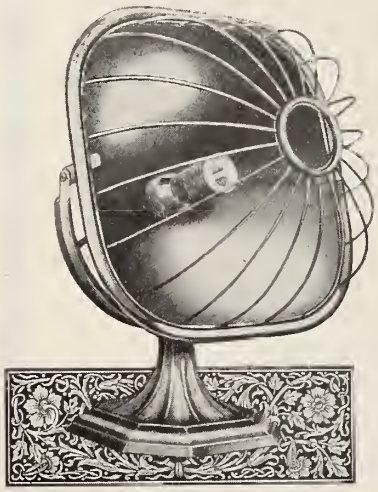
H. M. Hopper, 57 Dock St., St. John, N. B.
Sumner & Co. Limited, Moncton, N.B.
La Cie des Nouveautes "UNIVERSEL", 211 Rue Des Fosses, Quebec City.
Dalyte Electric Ltd., 556 Aylmer St., Montreal.
Dalyte Electric Ltd., Sanford & Main Sts., Hamilton.
Dalyte Electric Ltd., 163½ Church St., Toronto.
E. H. Briggs & Co., 619 Avenue Bldg., Winnipeg, Man.
Straton-Steward Ltd., 239—10th Ave. East, Calgary, Alta.
The Western Lighting Agencies, 109—23rd St. East, Saskatoon, Sask.
Midland Electric Co. Ltd., 3129—10th Ave., Regina, Sask.
Dalyte Electric Ltd., 325 Howe St., Vancouver.

TIPLESS *Dalyte Holo-Stem* LAMPS

L&H REFLECTOR HEATERS use ELEMITE



DOUBTLESS the outstanding reason for the marked success of the L & H Reflector Heater is its dependable heating element. The reputation of A. J. Lindeman & Hoverson Co. of Milwaukee, prominent manufacturers of Stoves, Ranges and Sheet Metal Ware since 1890, demands "quality materials" throughout. Significant verification of the rigid R & L policy will be found in the fact that heating units of all R & L Reflector Heaters are based on ELEMITE porcelain cores



ELEMITE FOR LONG SERVICE

ELEMITE is the one dependable porcelain structure suitable for use in the heating element of Quality electrical appliances. It is Flexible. Will expand and contract with temperature changes, without cracking. Will pass the most severe temperature test ever imposed on porcelain. Elemite is produced in special shapes to the exact specification of customer.

Send sketch or model for cost estimates.
Write for samples for testing

THE LOUTHAN MANUFACTURING CO.
EAST LIVERPOOL, OHIO
FACTORIES
EAST LIVERPOOL, O. LAUGHLIN, O.



The success of a Transformer is a matter of design, selection of materials and workmanship.
The present Moloney design is the result of years of experiment and development. Engineers of the highest repute have placed their approval upon it.
The materials, as they are finally treated and prepared for our use are not excelled —and, in fact, rarely duplicated—in the transformer field.
The workmen engaged in our plant are past masters of their craft, and are aided by a new and completely equipped plant.

MOLONEY ELECTRIC COMPANY OF CANADA LIMITED
Factory and Head Office:
213-219 Sterling Road, Toronto, Ont.
Branch Offices:
Montreal, Halifax, Winnipeg
Agents: General Supplies Co., Calgary, Alt. Frank Darling, Vancouver and Victoria, B. C.

Moloney Transformers

Electrical
Mechanical
Chemical

Directory of Engineers
and Special Representatives

Testing
Research
Patents

Canadian Water-Powers Agency
(Registered)
CHARLES BRANDEIS, C.E., E.E.
Consulting Engineer
We negotiate sale and purchase of developed and undeveloped water-powers.
Estimates made on power available and costs of development.
390 Phillips Place, MONTREAL
Telephone Uptown 2825.

KERRY & CHACE, Limited
ENGINEERS
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Associates: A. L. Mudge, H. R. McClymont
A. T. C. McMaster, H. B. Proudfoot
Hydro Electric & Steam Power Developments, Steam & Electric Railways, Pulp & Paper Mills, Industrial Engineering.
Confederation Life Bldg., TORONTO

R. S. KELSCH
Consulting Engineer
Steam, Hydraulic, Electric,
Reports, Estimates, Arbitrations
Power Building, MONTREAL

Beaubien, Busfield & Company
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Trade Marks and Designs Procured in all Countries
Special attention given to Patent Litigation

Pamphlets sent free on application

Ridout & Maybee
156 Yonge St. Toronto, Ont

Electrical Testing Laboratories

"Electrical, Photometrical and Physical Tests and Inspections".

80th Street and East End Avenue,
New York, N.Y., U.S.A.

Charles H. Mitchell
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Hydraulic, Steam and Electrical Power Plants, Industrial and Municipal Engineering.
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ALLEN ENGINEERING CO.
INSPECTION ENGINEERS
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Mechanical Engineer and Registered Attorney
Expert in Patents, Trade Marks, Designs, Copyrights and Infringements. 20 Years' Experience in Patents and Practical Engineering
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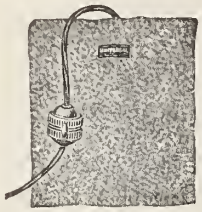
!

This Space is Available

This two color attractive space is available at a cost of only $60.00 per inch, per year of 24 issues reaching 3,500 electrical men throughout Canada. The above firms whose cards are shown find this small space especially valuable and many of them have been with us for years.

Write to-day!

Electrical News
349 Adelaide Street West, Toronto







CHRISTMAS——————

will soon be here

Our stocks of Percolators, Grills, Irons, Curling Irons, Heating Pads, Tea Pots, Samovars, Waffle Irons, Sewing Machine Motors, Hair Dryers and Xmas goods are ready for your orders.

The most careful consideration has been given to the selection of our Xmas lines.

Write us for our catalogue—Place your orders early and assure delivery.

GREAT WEST ELECTRIC CO., LIMITED

87 KING ST., WINNIPEG

These Dark Days — Sell

"Electrolier"



The rare beauty of these "Electrolier" creations will help you sell many more fixtures this winter. They are gracefully designed and exquisitely finished in the newest tones. The new Polychrome fixtures in Morocco and Old Silver come in a wide range and offer wonderful sales possibilities.

Write for our handsome catalogue today. It will aid in making sales.



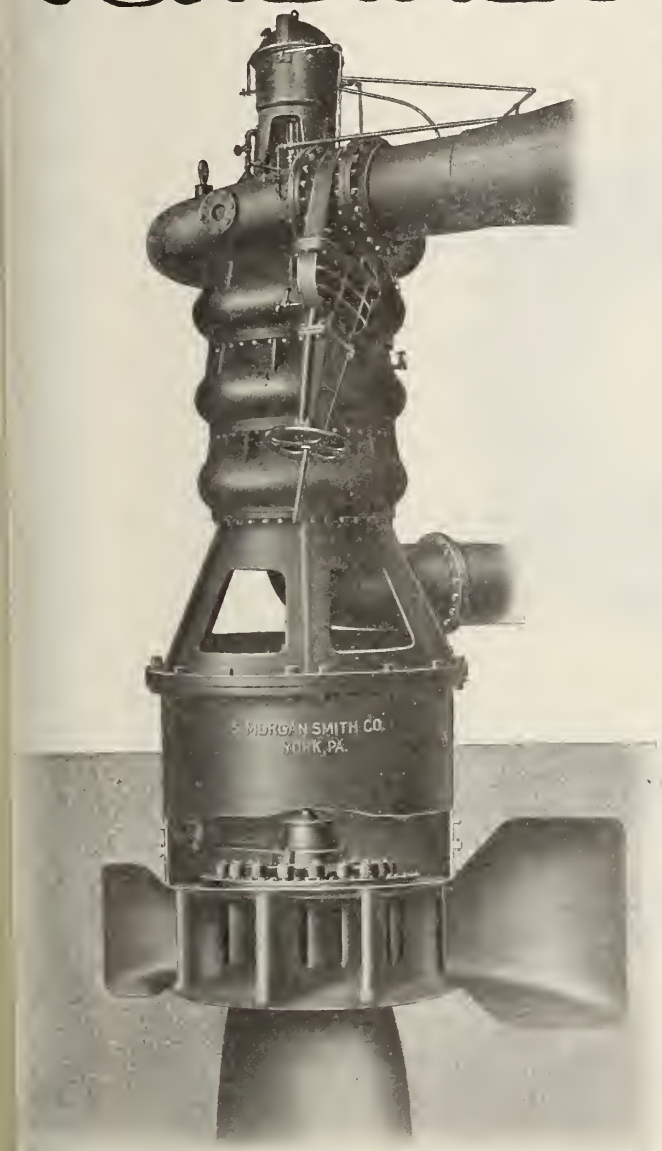
Number 1252
Finished in Morocco
Plate .....5 x 8 inches
Extends .....6 inches

Number 1105
Finished in Dull Old Gold
Length .....36 inches
Spread .....18 inches

ELECTROLIER MANUFACTURING CO. LIMITED

40 St George St. — Montreal, P.Q.

SMITH HYDRAULIC TURBINES



Above illustration shows Smith turbine operating under 21 feet, driving direct connected vertical shaft four-stage pump delivering 7500 gallons per minute against 78 ft. lift, for irrigation purposes, installed by U.S. Reclamation Service.

Bulletin "N" shows many uses to which Smith Turbines may be adapted.

S. MORGAN SMITH CO., York, Pa.

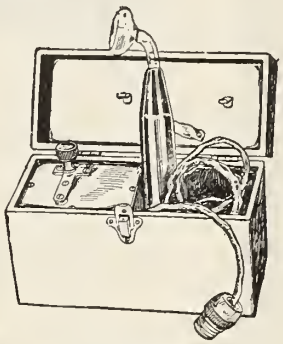
H. B. Van Every, Representative, 405 Power Bldg., Montreal

The STAR-Rite Line

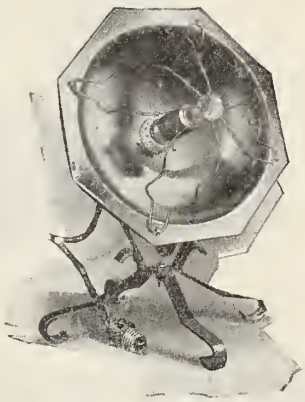
offers most timely Christmas suggestions — *and at Retail prices that stimulate buying*



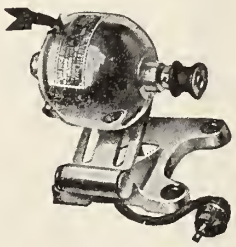
Motor Vibrator
Retails $17.50



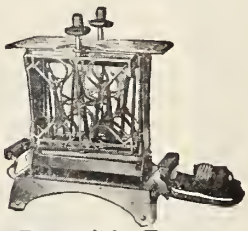
Violet Ray
Retails $17.50



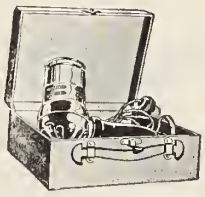
Model D Heater
Retails $6.75



Sewing Motor
Retails $18.50



Reversible Toaster
Retails $6.75



Hair Dryer
Retails $17.50



Three-Heat Pad
Retails $9.00

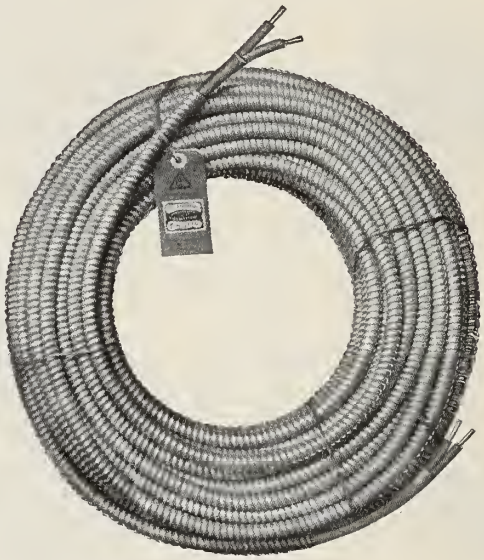


Waffle Iron
Retails $12.00

ABSOLUTELY GUARANTEED

The Canadian Fitzgerald Mfg. Co.
95 King Street E. :-: TORONTO

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SYMBOL OF SAFETY



"TRICABLE"
Armoured Conductors

Selling Agents—

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COCHRANE STEPHENSON CO.

WINNIPEG - VANCOUVER

"Reel Service"

From Coast to Coast

Canada Wire & Cable Co. Limited

Halifax Montreal Toronto Regina
Winnipeg Calgary Vancouver



Get Our New Hand Book

This handy little book is full of valuable information for the electrical engineer, contractor, construction man, repair man, etc., and a copy will be gladly sent on application to our nearest branch. Write or phone for it today.

A New Development

"A two pole Solenoid Operated I-T-E Field Discharge Circuit Breaker so designed that the mechanism controlling the discharge clip is positive in its making of the contact before the breaking of the main circuit."

This is the type used in the new Cahokia Central Station at St. Louis—one of the largest in the world. Write for particulars.

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ESTABLISHED 1888 PHILADELPHIA

24 Adelaide St., E., TORONTO

Interior Telephones

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Apartment House, Factory, School, Hospital, Office

Electric Reset Annunciators and Signal Specialties

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A complete new silent call system for hospitals. Registers at nurses' quarters and office with time record, if wanted.

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Vancouver, B.C.

Timberlake & Bourne
New Birks Bldg.,
Montreal, Quebec

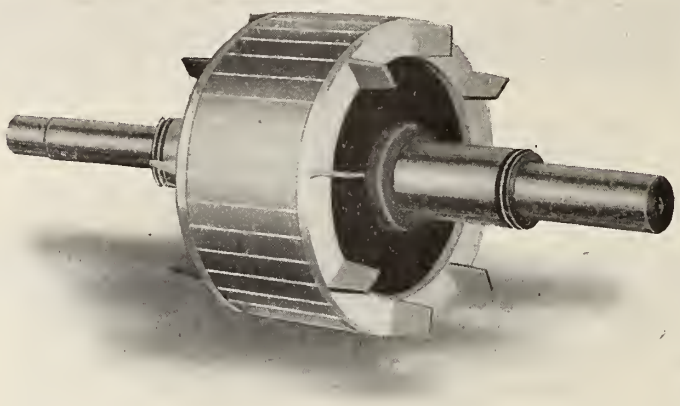
The Pierce Electric Company,
104 Richmond St. West,
Toronto, Ontario

CONNECTICUT TELEPHONE & ELECTRIC COMPANY
MERIDEN CONNECTICUT

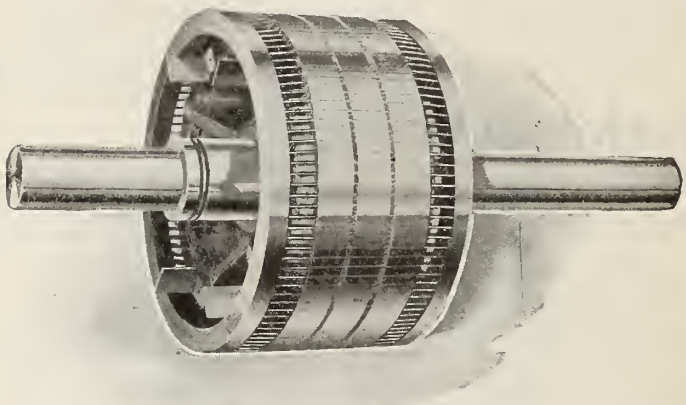
The Star Porcelain Company

TRENTON, N. J.

Manufacturers of Electrical Porcelain Specialties. Also specialize in the manufacture of heater bricks for electric ranges.



Canadian Crocker-Wheeler Cast Winding Rotor—for small motors



Canadian Crocker-Wheeler Cast Welded Rotor—for large motors

There are no soldered joints or bolted connections in Canadian Crocker-Wheeler rotors—no soldered joints to melt and cause arcing or open circuit, and no bolted connections to work loose and cause shut downs for repairs. The entire Rotor Winding of small squirrel cage induction motors is cast of aluminum alloy —in one operation. Thus, the complete winding is one integral structure. The medium and large size Rotors have liberal section copper bars and the end rings are cast welded, making perfect contact. An outstanding improvement in induction motor design.

THE CANADIAN
CROCKER-WHEELER CO.
LIMITED

Manufacturers and Electrical Engineers

Head Office & Works:
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District Offices:
Toronto, Montreal, Sydney, N.S., Ottawa

Also all Branches of

Northern Electric Company
LIMITED

Montreal, Halifax, Quebec, Toronto, Hamilton, London, Windsor, Winnipeg, Regina, Calgary, Edmonton, Vancouver.

Throughout 1924

Truly Imperial Products

Satisfy your Customers and add to your profits by using Wiggin's Electrical Resistance Materials—made from Canadian Ores by English metallurgists of very long experience, suppliers to the Navy for more than twenty years, no specifications can be more severe than theirs.

We make a suitable grade for every requirement, in wire, ribbon, rod or sheet form.

"Brightray" for Furnaces, Cookers and other high temperature appliances.

"Glowray" for Toasters, Laundry Irons and other lower temperature appliances.

Write for contract prices stating in detail your anticipated requirements—it will repay you.

We carry a large stock in Montreal for your convenience.

Manufactured by
Henry Wiggin & Co., Limited
Birmingham, England

Canadian Distributors
WOODBURN'S LIMITED
Telephone Main 1790
137 McGill Street **Montreal, P.Q.**

CANADIAN PORCELAIN CO.
LIMITED

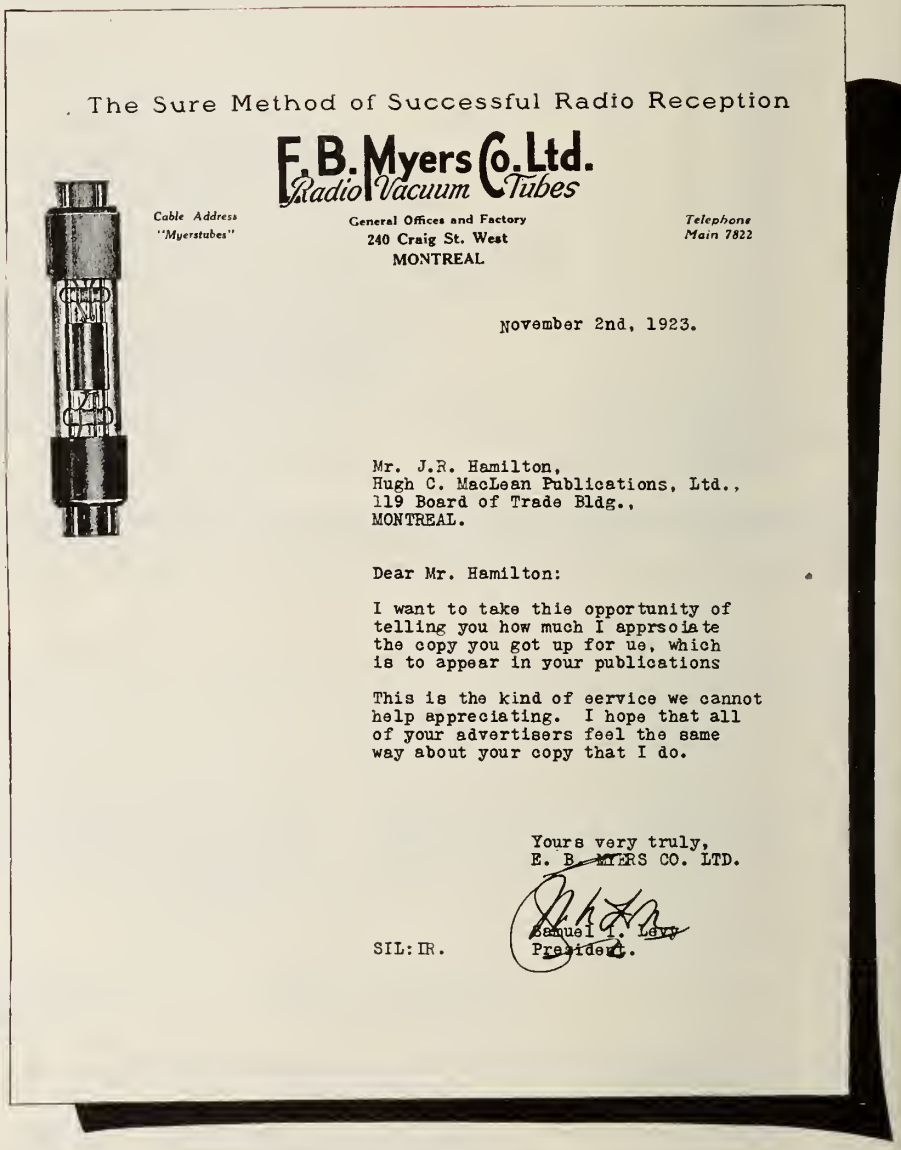
HAMILTON - CANADA

Manufacturers of High and Low Tension Porcelain Insulators

Service is Appreciated

E. B. Myers Co. Ltd., manufacturers of Radio Vacuum tubes, are perhaps the most extensive advertisers of Radio tubes in Canada. They recently signed a contract for large space in ELECTRICAL NEWS this contract covering inside pages and also front covers. The Service Department of this paper has been co-operating with Mr. Levy in the preparation of the firm's advertising copy and this co-operation has inspired the accompanying letter, which came entirely unsolicited.

The point of interest to advertisers here is that not only does ELECTRICAL NEWS afford the only effective means of presenting an advertising message to the entire electrical trade, but through our Service Department we help the advertiser to make that message as attractive and as appealing as possible.



The Sure Method of Successful Radio Reception

F. B. Myers Co. Ltd.
Radio Vacuum Tubes

Cable Address "Myerstubes"

General Offices and Factory
240 Craig St. West
MONTREAL

Telephone Main 7822

November 2nd, 1923.

Mr. J.R. Hamilton,
Hugh C. MacLean Publications, Ltd.,
119 Board of Trade Bldg.,
MONTREAL.

Dear Mr. Hamilton:

I want to take thie opportunity of telling you how much I apprsoiate the copy you got up for ue, which is to appear in your publications

This is the kind of eervice we cannot help appreciating. I hope that all of your advertisers feel the same way about your copy that I do.

Yours very truly,
E. B. MYERS CO. LTD.

Samuel T. Levy
President.

SIL:IR.

This service is at the disposal of other manufacturers. We are always pleased to co-operate with advertisers. That is an essential part of an advertising contract in this paper.

Westinghouse Type CD Watthour Meter





Double-Jewelled Ball Bearing

The unequalled sustained accuracy of Type CD Meters, under both light loads and varying overloads, is due to the **Double Jewelled Ball Bearing** on the main shaft, an exclusive Westinghouse feature. The bearing is friction-less in operation and requires no lubrication.

Send for Folder E-66 giving full details.

Canadian Westinghouse Co., Limited, Hamilton, Ontario

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HALIFAX, 105 Hollis St.
CALGARY, Canada Life Bldg.
MONTREAL 285 Beaver Hall Hill
FT. WILLIAM, Cuthbertson Block
VANCOUVER, Bank of Nova Scotia Bldg.
WINNIPEG, 158 Portage Ave. E.
EDMONTON, 211 McLeod Bldg.
OTTAWA, Ahearn & Soper, Ltd.

Repair Shops

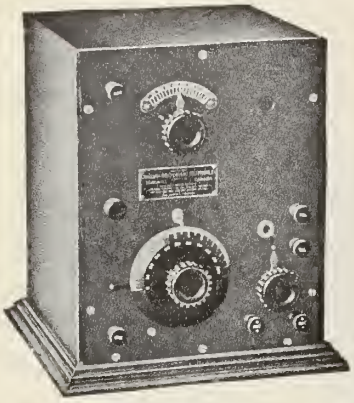
MONTREAL, 512 William St.
WINNIPEG, 158 Portage Ave., E.
VANCOUVER 1090 Mainland St.
TORONTO, 366 Adelaide St. W.
CALGARY, 320 8th Avenue West

Westinghouse

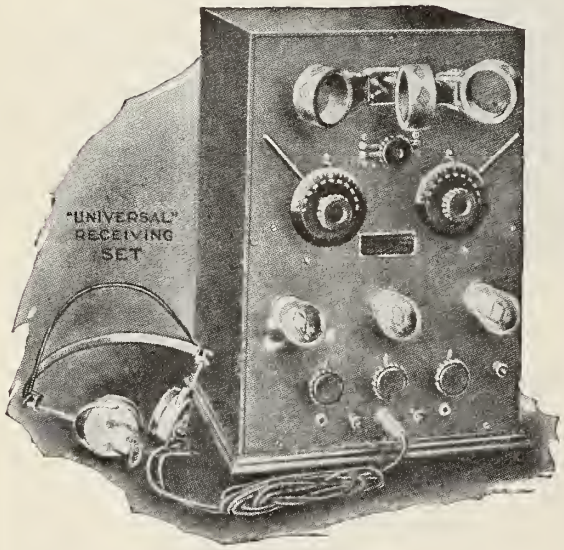
Closing the Xmas Sale is Easy

When it is for one of our Radio Receiving Sets

BECAUSE



SC 10. Receiver



Universal Receiver

When compared with other sets the difference in quality of reception is easily noted.

Anyone can see by examining our sets that nothing cheap enters into their construction.

They are made in Canada.

As manufacturers of high grade telephone apparatus for many years our reputation is firmly established.

Our prices are lower than expected for sets so well designed and made.

Our Radio sets are known to give the satisfactory results the purchaser expects.

We offer the Electrical Dealer an opportunity to get into the Radio business in a profitable way.

Now is the time to sell Radio Sets. ***Write us today.***

Canadian Independent Telephone Co., Limited

Toronto, Canada

Manufacturers of Telephone and Radio Equipment

Radio Corporation of Winnipeg, Limited, Winnipeg, Man.
Radio Corporation of Vancouver, Limited, Vancouver, B.C.
Radio Corporation of Calgary, Limited, Calgary Alta
Radio Corporation of Regina, Limited, Regina, Sask.

QUALITY RADIO SUPPLIES

We stock only the most reputable lines such as:

Frost	Atwater Kent Co.	Homecharger
Brown	Howard Radio Co.	Valley Charger
Pacent	Hart "A" Batteries	Northern Elec. Co.
U. S. Tool	Burgess Batteries	Westinghouse Sets
Murdock	Eveready Batteries	Marconi Wireless Co.
Magnavox	Condensite Celoron	Can. Indept. Tel. Co.

Price list now ready *Discount Sheet to Dealers*

TORONTO RADIO COMPANY
6 Yonge St. Arcade Toronto, Ont.

EFFICIENCY

OF OVERLAPPING JOINTS IN COPPER AND ALUMINIUM BUS-BAR CONDUCTORS IS DEALT WITH IN OUR BROCHURE NO. 178.

Write now for your copy

THE
BRITISH ALUMINIUM CO. LIMITED
592 KING ST. W. TORONTO

KLITZEN

REGENERATIVE—

Receiving Sets

Real Radio Simplicity

Only one adjustment

Licensed under Armstrong Patents

The principal feature of No. 525 Regenerative Tuner Detector, 2-stage audio amplifier is SIMPLICITY.

Any operator can get wonderful results because there is only one adjustment. Receiving Range practically the same as that of the best radiophone equipment on the market.

Each unit carefully tested before shipment. The best material and most highly skilled workmanship employed —it is the product of experts who have been making radio equipment since 1913.

JOBBERS AND DISTRIBUTORS. Write for full information and big discounts. DEALERS—ask your jobber or write us.

KLITZEN RADIO MFG. CO , Inc.
Racine, Wis.



MODEL No. 525 LIST PRICE $80.00



R. F. Unit
$3.50



R. F. Transformer
$2.50



A. F. Transformer
$4.50



Variable Condensers Plain and Vernier
$2.25 to $6.50

UNITED
RADIO PRODUCTS

EVERLASTINGLY guarding quality has established United Radio Products on a quantity production basis. Dealers everywhere were quick to sense these products as **safe** sellers. They stayed sold and gave not only unusual radio results, but pleasure and satisfaction to their owners. They were repeaters.

As new circuits developed, calling for more parts, United, on account of past performance, were again purchased.

You too can build up this confidence in your store by handling United Radio Products.

We shall be glad to mail you catalog on

Write for illustrated folder and discounts

United Mfg. & Dist. Company
9708 Cottage Grove Ave., Chicago
N. Y. Offices: 50 Church St., New York
San Francisco Office; 709 Mission Street

MICA

Canadian Amber **India Ruby**

All forms of Mica Insulation.
Cut to size—Selected to Pattern—Segments.
Mica Splittings—Washers—Ground Mica.
A complete stock of Clear Ruby Mica for Stove and other purposes.

S. O. FILLION

Head Office: 86-88 Duke St., Ottawa, Canada

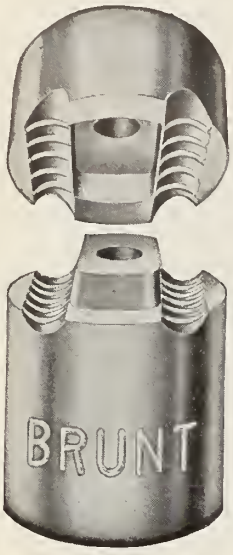
New York Office
86 Murray Street

India Office,
Kodarma, Benga

MICA

Reliable Mica Insulation
OF EVERY DESCRIPTION
Commutator Plate Motor Ring
Moulding & Flexible Plate Tubes
Raw Mica [cut and uncut] Ground Mica
MICA COMPANY OF CANADA Ltd.
HULL, Quebec

BRUNT



HIGHEST QUALITY

PORCELAIN

KNOBS
TUBES
CLEATS
AND
SPECIALTIES

CANADIAN REPRESENTATIVES
Duggan Import Sales Co.,
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Toronto, Ontario
Russell Fowler Co.,
306 Notre Dame Avenue,
Winnipeg, Man.

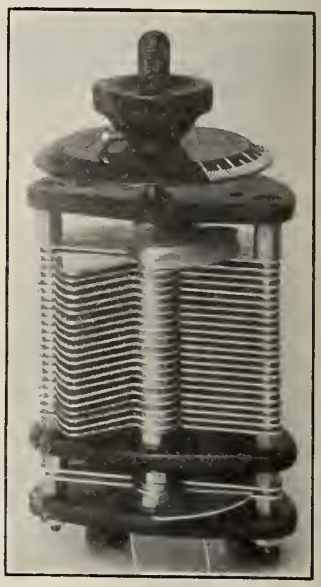
THE BRUNT PORCELAIN CO.
Columbus Ohio

Dealers Wanted

Vernier Balanced Condenser

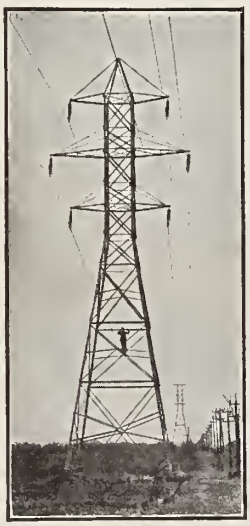
The new ultimate, variable Vernier Balanced Condenser is now ready for delivery. This is without doubt the peer of condensers. Exclusive territories given on a quantity basis.

Made in 41, 23 and 13 plate sizes including vernier. List Price $6.50, $5.75 and $5.00.



RADIO SHOPPE
1431 Queen St. W., Toronto

GALVANIZED STEEL
TOWERS AND POLES



Standard Tower Hydro
Electric Power Commission of Ontario

The modern means of supporting overhead wires.

Power
Telephone
and
Trolley
Lines

We shall be pleased to furnish designs and estimates upon request.

The Canadian Bridge Co., Limited
Walkerville, Ontario, Canada
Structural Steel of all Kinds
Montreal Office in New Birks Building.

They Never Fail

It is difficult to over-estimate the value of springs in keeping the wheels of production moving.

They keep on doing their work, never faltering under the regular stress and strain that is placed on them.

Barnes-made springs bring you the assurance of good material and good workmanship.

The WALLACE BARNES CO.,
Limited
Hamilton — Canada

Toronto's New Schools



Riverdale Technical School, Toronto

Are Being Equipped with Cased-Glass Units

Jefferson units
were selected on their
merits over all
Units Submitted

Write for illustrations
of Jefferson Units



No. 399½

Efficiency
Service
Cleanliness
Appearance

Sold thru the
Electrical Trade Only

Installation by McDonald & Willson, Ltd., Toronto

We Sell the Glassware only

FACTORY & HEAD OFFICE
388 CARLAW AVE
TORONTO

DOWN-TOWN SHOW ROOMS
164 BAY ST. TORONTO

Jefferson Glass
MADE IN CANADA
COMPANY LIMITED

285 BEAVER HALL HILL
MONTREAL
272 MAIN STREET
WINNIPEG
510 HASTINGS ST. W.
VANCOUVER

Design
Value
Service

Win-Joy
PRODUCTS

And
Made in
Canada

STREET LIGHTING EQUIPMENT

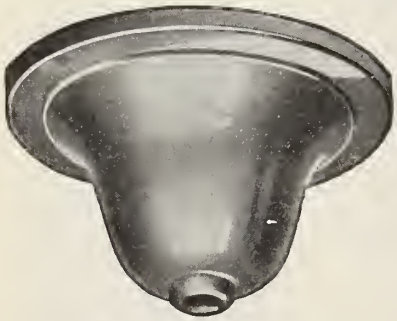
WINTER JOYNER
COMPANY, LIMITED

The Address is
455 KING ST. WEST
TORONTO

The Telephone is
ADELAIDE 7880

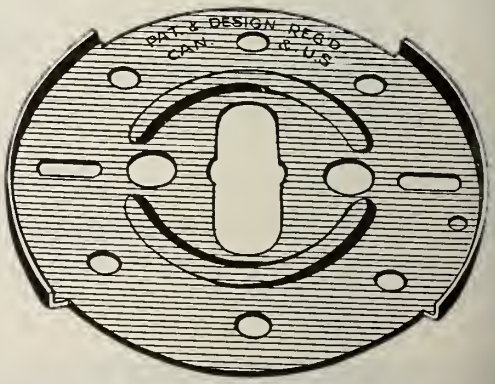
IMPORTANT

The tapped lugs on outlet boxes vary from 2⅝ to 3½ inch centres, but



Twin Canopy

JEUNE CANOPIES fit all boxes



Approved by the H. E. P.C.

And there are fifteen different kinds of boxes. Will also fit any fixture outlet. No special fittings required.

The only fixture attachment that will do this.

BEWARE OF SUBSTITUTES

Jeune Canopies are for sale at all jobbers

The Jeune Canopy & Mfg. Co. 1260 Queen St. W. TORONTO, ONT.



IT gives us genuine satisfaction to ally our own trade-mark with those of the well-known companies here represented.

Each trade-mark stands for a quality product that has long since established its worth. wherever electrical work is done.

Complete stocks are carried at our Branch Houses.

Northern Electric Company
LIMITED

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"Makers of the Nation's Telephones"

MANUFACTURING
Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and receiving Equipment

DISTRIBUTING
Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

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Manufactured and Installed for

Ottawa Hydro Electric Commission

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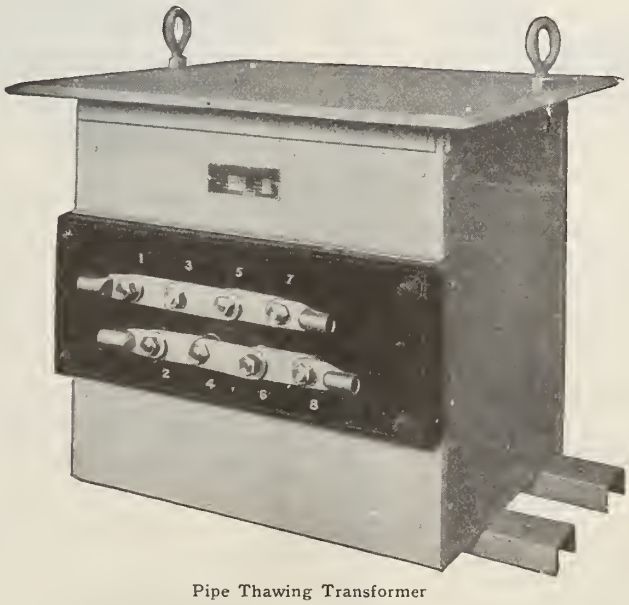
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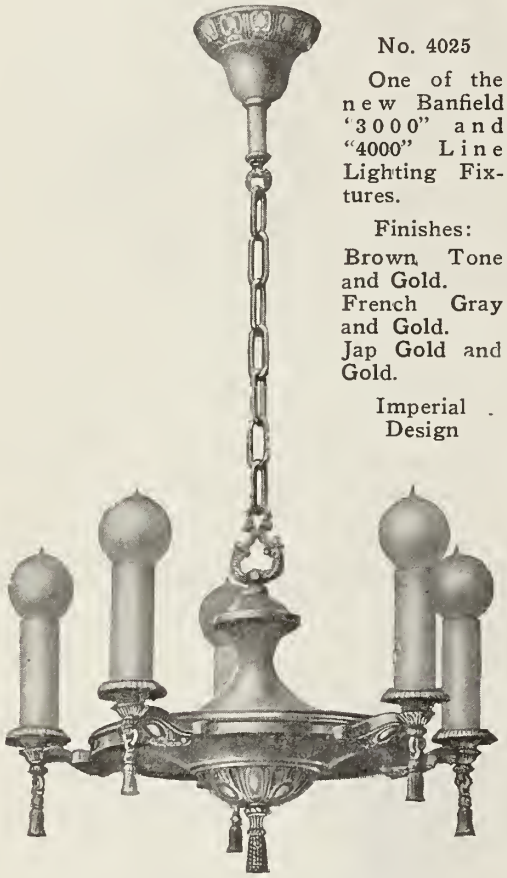
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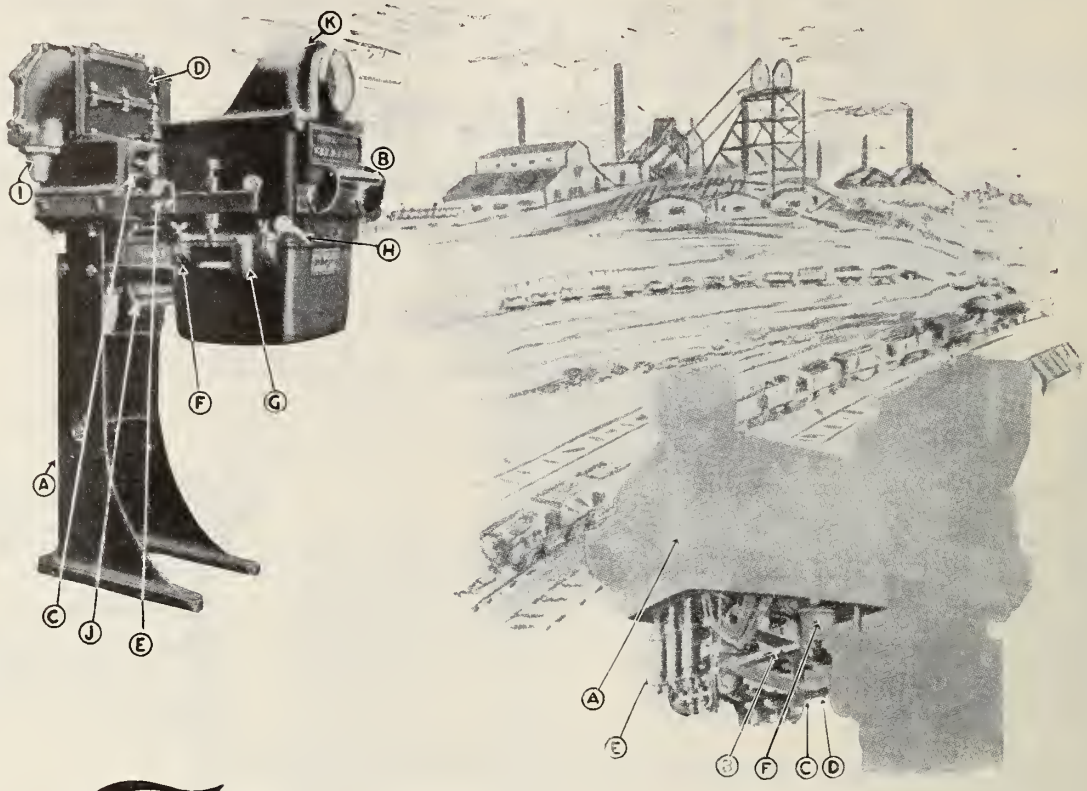
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UPPER FIGURE

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E. Definite stop to prevent overrunning carriage.
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G. Oil level gauge and filling arrangement.
H. Gravity controlled lever for cutting out overload releases.
I. Cable fittings for all classes and sizes of cables.
J. Hinged door to shield receptacles after removing circuit breaker carriage.

LOWER FIGURE

A. Circuit breaker carriage, can be padlocked.
B. Free handle operated by simple toggle mechanism with accelerating springs and oil dash pots.
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ELECTRICAL NEWS

DEVOTED TO THE INTERESTS OF
A UNIFIED ELECTRICAL INDUSTRY

Vol. 32 | Toronto, December 1, 1923 | No. 23

United Effort Will Boost Fixture Sales

Gift Business Provides Opportunities for all Lighting Goods—Sales Curve Shows Unnecessary Drop

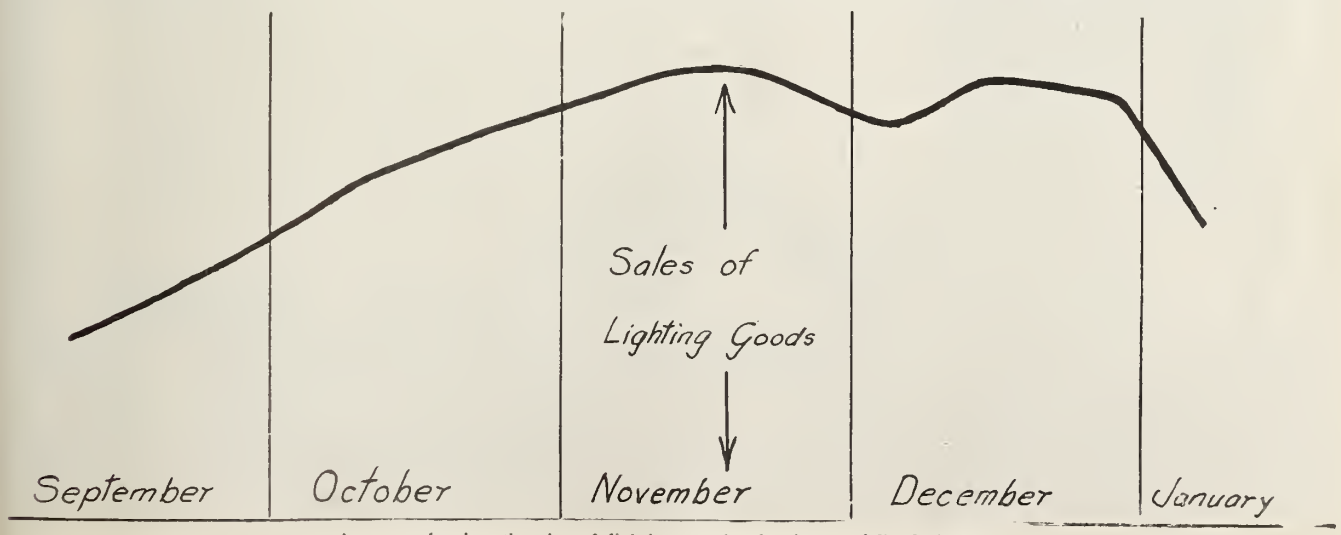
IN the autumn, when daylight decreases, a keener fixture demand becomes evident. September, October and November are all good months with peak fixture sales located somewhere in November. The general situation is graphically shown in the accompanying curve, which is based on total sales of lighting goods. We find a smooth, gradually rising curve, that slants gradually up, beginning the ascent in September, getting steeper in October, and reaching a smooth peak in November. Then it drops a little, till in Mid-December the sales of gift goods push it up again to a rather sharp peak. The end of December witnesses a decline, which would be startling if we were not used to it.

United effort by dealers will straighten out this curve or perhaps, boost the peaks, especially the one that occurs in mid-December. It means a push on all lighting lines. Too often fixtures are not regarded as holiday goods with the result that they are left in the background and portable lamps and appliances of various kinds are pushed in their stead. A man who has a stock of fixtures and wants to see them move; can make sure that they do so by putting forth extra sales effort at this season.

It is difficult to give any specific reason why fixtures should move more rapidly at this time than any other, but they will, and in general it may be said that people are now spending money freely and when it is a question of replacements, or when the need of a new fixture becomes evident, they are much more likely to go to the extra expense at this time than during the hot summer months or in the cold weather that follows Christmas.

It is also true that fixtures are bought for gifts. Children club together to buy the mother a new dining room fixture. The father of the household decides that a new set of fixtures will add the necessary touch to the brightness of the home. There is a continual replacement of all goods and this naturally accounts for a number of the sales. It is true that this Christmas business in fixtures must be clearly distinguished from the complete installation work which features the trade in the early part of the year. Here the supply of a full set of fixtures for the house is unusual, but we find instead that the dealer has a large call for odd fixtures for the living room, dining room, hall, and bedroom.

As a means for increasing the turnover in fixtures



A curve showing the rise of lighting good sales in the fall of the year

at this season, it is suggested that besides the usual pressure which may be put on by careful window displays and suitable arrangement in the store, the use of circulars suggesting electric fixtures for gifts in the home, as well as lamps and appliances, would achieve the desired result. Those dealers who keep an up-to-date mailing list can perhaps circulate letters which would have the right appeal, or blotters.

In another part of this issue will be found a window by Cully and Breay, of Hamilton, Ont., that brings lighting goods prominently to the eye of the public. Floor lamps, portables and fixtures are all represented here, with good results. It happened that at the time this window was shown, four other electrical dealers in Hamilton were displaying the same kind of goods in their windows, and the result was a united drive that produced good results.

In the aggregate, there are a lot more fixtures sold at this time of the year than is generally recognized. The purpose of this article is achieved if the electrical dealer who handles fixtures is made aware of the fact that there is a real merchandising opportunity for him right now. Let him look over his stock of fixtures, turn in his sorting orders immediately: clean up his showrooms; ticket fixtures with attractive prices, and get after the business in any of the ways we have suggested. The result will be an eye-opener.

Where Our Customers' Money Goes

The fact that money which might go to the purchase of electric washing machines, vacuum cleaners and other electrical labor-saving devices, is being spent on automobiles, is strikingly brought out by the Quebec Telegraph, in a recent article. Some of the claims made are as follows: In Ontario last year, licenses were issued to 210,000 passenger motor cars and 24,000 commercial cars, not to mention 4,700 motor cycles. Allowing an annual outlay for operation of $400 for each one of the 234,000 cars means a total of $94,000,000, and supposing cars cost on an average $4,000 each and allowing 15 per cent. for replacements gives another $35,000,000, or a total of $129,000,000. Ontario's most valuable field crop is hay, which in 1921 was valued at $76,000,000. Adding the second crop, oats, at $36,000,000 it would still be necessary to throw in the greater part of the cattle sold and slaughtered, value $37,500,000, in order to pay 1922's automobile bill. Or to put it another way, the total value of Ontario's field crops in 1921 was $222,000,000, and more than half of it was spent on automobiles in 1922—much more than half if the expenditures on roads and other incidentals is considered.

Read First Story of Abitibi Plant

Elsewhere in this issue will be found a description of one of the largest hydro-electric developments in Northern Ontario, that of the Abitibi Power & Paper Company at Twin Falls, Ont.

The Hydro-electric Power Commission of Ontario have issued a new Manual dated August 22, 1923, outlining procedure necessary to obtain approval of electrical equipment to be used in the province of Ontario; schedule of charges is included.



A seasonable window by Culley & Breay, Hamilton. It sold the goods



Co-operative Window Dressing by Electric Service League

Toronto Electrical Dealers Get Christmas Displays Arranged Gratis By Experts

The workmanlike manner in which the Electric Service League of Toronto is prosecuting its Christmas campaign needs no better illustration than the window shown above. This display was arranged in the store window of Mr. R. A. L. Gray, under the auspices of the Electric Service League. Dealers will appreciate that this window is attractively arranged and carries a selling idea, even with the handicap of narrow width. It is a tangible evidence of the success of the co-operative window dressing scheme of the Electric Service League, a plan which promises to be one of the most valuable innovations ever introduced into the selling of electrical goods. The idea emanated from the Christmas campaign committee of the League, consisting of Mr. C. H. Hopper, chairman, Messrs. J. Herbert Hall, W. R. Ostrom, H. H. Rimmer and A. W. J. Stewart.

How to Handle Electric Motors and Generators—1

First Article of a Series Giving Complete Instruction on Installation and Maintenance of Electric Motors and Generators

All motors and generators are shipped completely assembled ready to set on the foundations, except those sizes which are limited by transportation and handling facilities.

When machines are received, they should be kept in a dry, clean place and especially when they are put in storage and are not installed immediately.

Machined parts are slushed or painted before shipment to prevent rust. If machines are to be stored for any length of time, those parts should be inspected periodically to see that rusting has not started and reslushed if necessary.

A safe and reliable heating system should be provided to protect the windings of machines from alternate freezing and thawing. An electric heater with a thermostatic control is recommended when sufficient current is available.

The life and successful operation of electric motors and generators depend upon their proper installation and maintenance as well as upon their proper design and manufacture. While motors and generators require less care than almost any other type of power apparatus, neglect of certain fundamental requirements may lead to serious trouble if not to the loss of the equipment. A wide distribution of information of this character is, therefore, important and these brief instructions have been prepared by the Electric Power Club for the assistance of those responsible for the installation, operation and maintenance of electric motors and generators.

Unpacking

Unnecessary handling of machines at low temperature should be avoided as castings are more easily broken at very low temperature than at normal temperature.

When unpacking and handling machines the windings and other parts should be protected from damage.

Machines should be thoroughly inspected as soon as they are unpacked to see if they have been damaged in transit and to make sure that all parts, accessories, etc., are in the proper condition and position. All instructions and connection diagrams received from the manufacturer should be left with the machine.

If the windings of a machine have been exposed to low temperature, they should not be uncovered until they have had sufficient time to attain a temperature nearly as high as that of the room in which they are to be unpacked. If this procedure is not followed, the machine will sweat.

Handling

Traveling cranes are exceedingly convenient in handling machines. Where stations or factories are not so equipped it is desirable, except for very small machines, for the user to build a crib or horse of heavy timbers for handling the machine. It will be found convenient and advantageous to retain the crib for further use.

Whenever practical, a complete machine should be moved as a unit. This eliminates many possible troubles with windings, armature, slip rings, etc. Where machines are provided with eye bolts, these should be used for lifting in preference to slings. When lifting motor-generator sets, care should be taken not to spring the shaft by attaching the hooks or slings improperly.

Armatures—When necessary to move the armature or rotor alone, the only safe method of supporting it while either moving or stationary, is by slings or blocking under the shaft or by a padded cradle under the core laminations. The bearing journals must be protected so as not to mar the polished surface. The weight of the armature and field frame should not be allowed to rest on the base until the base has been levelled and grouted and the grout has had time to set hard.

The whole armature surface may be considered as subject to damage either to the bands, wedges, clips or insulation unless properly handled. Every precaution should be taken to avoid damaging any of the windings or other parts.

Commutator segments are very easily displaced and, therefore, an armature should never be lifted by passing a sling around the commutator. A spreader should always be used when lifting an armature to prevent the slings from drawing over armature band clips, collector rings, or commutator. Slings placed on the magnet frame must be so drawn as to avoid chafing the field coil insulation and the connections between coils. A rotor should never be lifted or supported by the slip rings.

If a wire rope is used for a sling, some waste or rags should be inserted between the sling and the machine to prevent marring the paint. In handling a complete machine, special care should be exercised to protect the oil gauges from damage.

All electrical machinery not especially constructed to resist injury by moisture should be kept dry. If a machine has been exposed to moisture, the windings should be thoroughly dried before the machine is placed in service. Small machines can be baked in ovens and larger units can be dried by passing current through the windings. In either case, however, the temperature should be kept within a maximum of 85 degrees C. The temperature should be raised gradually and should be kept as nearly uniform as possible throughout the windings both during the process of raising and while baking.

Toronto Licensing By-Law Finally Passed

Conditions and Fees Have Been Fixed and Licenses in Force by January 1st.

The By-laws with regard to licensing of electrical contractors and journeymen in the city of Toronto, and the township of York which adjoins the city of Toronto, have now been finally passed both with regard to the conditions of license and the fees to be charged. The original By-law No. 137, passed some time ago by the Police Commissioners requiring journeymen and master electricians to be licensed has been amended so that it comes into effect January 1, 1924, instead of October 1, 1923, as formerly indicated. This By-law was outlined in full in the Electricial News of September 1.

The city council has now passed By-lay No. 9809 establishing the license fees as follows:—a journeyman's license costs $1.00; a company electrician's license $15,00, and a contractor electrician's license $10.00. By company electrician is meant a contractor who does not himself personally engage in the work of wiring or installation. A contractor electrician is one who works either by himself or with one helper.

The matter of fees to be charged for examination is determined by the Examining Board itself. These cannot be definitely fixed until the operating expenses of this Board can be determined by actual experience, but in the meantime they have been named as follows:—for journeyman's examination $4.00; for company electrician's examination $15.00; for contractor electrician's examination $15.00.

It will be remembered that the original By-law required that a master electrician must be bonded to the extent of a thousand dollars. On the supposition that this bond will cost $10.00 it will be seen that the total expense to a company electrician as a result of the passing of these two By-laws will be $15.00 for license, $15.00 for examination, and $10.00 for bond; total $40.00. The total expense to a contractor electrican will be $10.00 for license, $15.00 for examination, and $10.00 for bond; total $35.00. The total expense for the journeyman is $1.00 for license and $4.00 for examination; total $5.00.

The township of York has also passed a By-law covering the same ground as the two city By-laws mentioned above. They have appointed an Examining Board and named the same fees as those established by the Toronto city council. The Examining Board is the same, with this difference, that the city's representative has been replaced by a county representative.

Another good feather about these By-laws is that they will be reciprocal, that is, a contractor or journeyman properly accredited in the city of Toronto can do work in the township of York and vice versa. The By-law of the township of York actually includes this reciprocal clause and it is understood the city of Toronto By-law will be worded accordingly.

Forms are now obtainable at the City Hall, Toronto, and they should be filed at once if the applicant wishes to make sure of having his license by January 1 next.

"Cooking By Wire" Display Sells Electric Ranges

The Lyons Electric Company, of Brantford, Ont., had an original window display recently. A figure was dressed up to represent a tramp sitting before a roadside bon-fire. The tramp was holding a piece of heavy wire on the end of which was a slice of bread which he was supposed to be toasting over the bon-fire. Close by was a sign which read "Cooking by hot plate and several descriptive cards. The window wire." In the same window was an electric range and created a good deal of interest and comment.



Some of the Canadian delegates who went to the recent international convention including Mr. and Mrs. H. Hicks, Mr. and Mrs. G. W. Moss, Mr. and Mrs. G. E. Davenport, and R. A. L. Gray



Let Santa Claus Help You!

A Little Batch of Suggestions That Will Help the Merchant Who's Out to Get His Share of the Christmas Business

Hundreds of thousands of Christmas trees are used in Canada every year, but only about a quarter of one per cent of them are electrically lighted, the remainder using dangerous wax candles, or nothing at all. A live idea to sell Christmas tree lighting outfits consists in placing a Christmas tree, set firmly into a box, outside the front of your store. Wire it up with a good set of the little Christmas lights, and attach a card explaining how it is done, and the price. The idea may be elaborated to almost any extent, the tree trimmed as well with tinsel and ornaments. A Christmas tree like this adds wonderfully to the holiday appearance of your store, and brings business in other things besides Christmas tree sets.

Radio Gifts for Invalids

A dealer who has been uniformly successful in selling radio, is this year featuring it as a Christmas gift for invalids. All his window cards and newspaper ads. stress the idea that there is nothing but radio which will so lighten hours of suffering and relieve the monatony of those who cannot get out in the world. He is also making a special appeal to several people who are known to be munificient givers to local charities, telling them how much brightness a good radio set can bring to a hospital or infirmary, or other institution whose inmates can not get out to enjoy the brightness of outdoors.

One Customer at a Time

At Christmas time, perhaps more than any other, you are likely to have extra help in the store. It is worth while to give them careful coaching on how to look after customers. Make it clear that they must wait on one customer at a time, without of course, giving offence to others who may speak to them. Remind them that the rush of extra business at Christmas time provides unlimited opportunities to make friends for the future. To often the tendency is for unexperienced clerks to rush ahead, neglecting and even insulting customers. Patience is particularly necessary at Christmas time, and all employees must expect to make an extra effort.

The "Color" Appeal
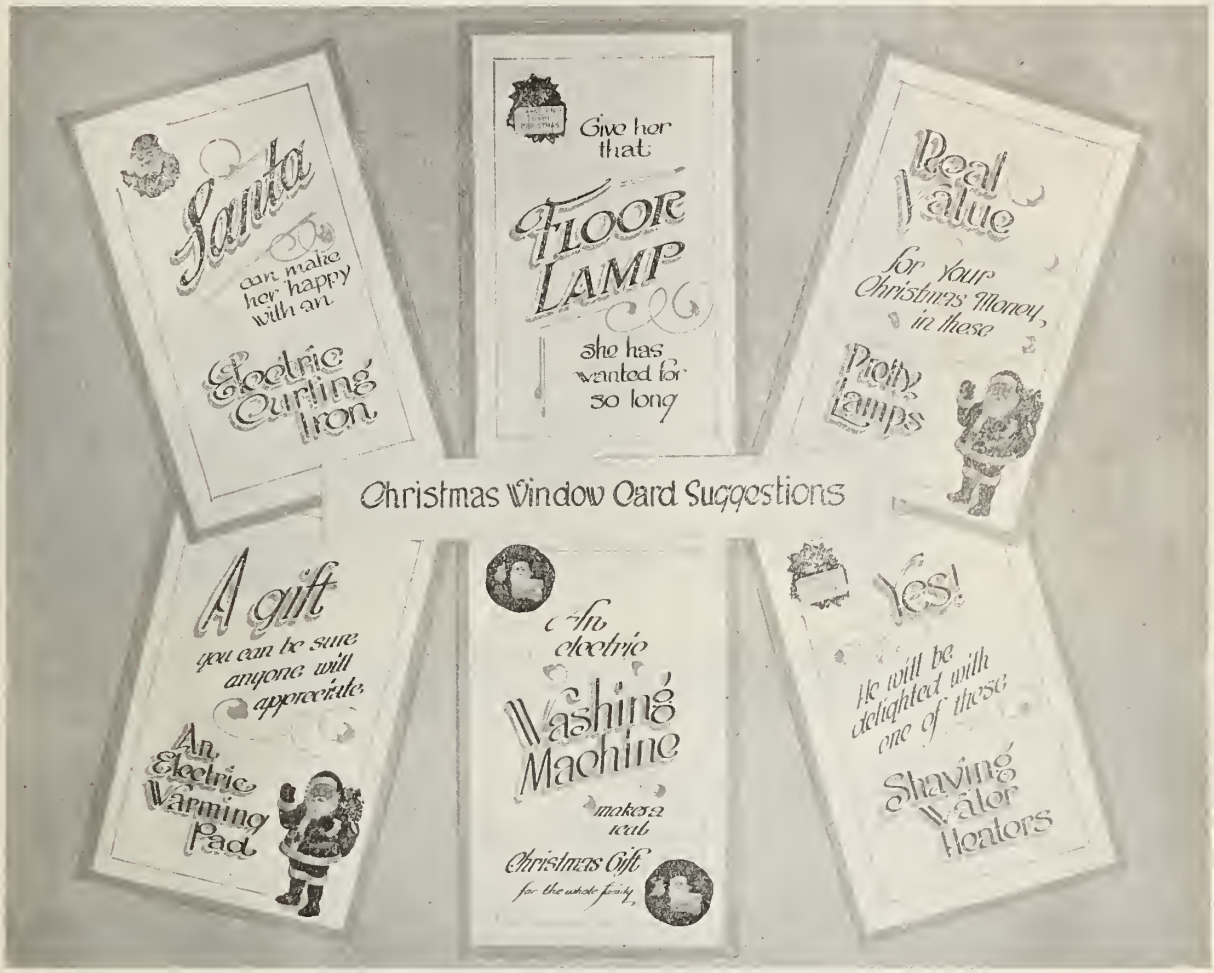
One way to stimulate interest in your children's gift department is to get hold of a little negro boy, dress him up in a fancy suit and silk hat, if available, and use him as a sort of novelty demonstrator. He can be used part of the time outside, if weather permits, patrolling the sidewalk in front of your store in a toy automobile, as well as in the window and in the gift department itself. If he can sing, "Yes! We have no Bananas," or "Barney Google," he'll make a hit. A live, novelty attraction of this sort has proved a remarkable crowd-producer. The costume is a very important point—it should be striking and pretty.

Little Things That Count

Keep the Christmas atmosphere up, use red and green sales cards, don't economize on holly and tinsel, bring gift goods up to the front of the store. A toy department should be given special prominence. Keep your stock of gift articles checked up; and have enough reserve stock on hand to fill any holes that may appear.

A Window Display

Strew little branches of holly on the floor of your window and from the centre of the ceiling hang a big spray of mistletoe, from which let narrow red or colored ribbons radiate to all corners of the window. At one side place a Christmas tree covered with tinsel, ornaments and lights and hang with toys and dolls, while on the floor set larger toys, boxes, etc. This display will attract the attention of every child who passes and, naturally, when the youngsters stop the grown-ups having them in charge also will stop.



Christmas cards that will help your window display

Selling Gifts to Husband and Wife

Two Ideas for Both Sides of the Family

Treat Your Wife

The old sales stunt of appealing to the husband to make a suitable gift to his wife at Christmas time is still being effectively used. Merchandise that falls in this category is, of course, the larger appliances such as vacuum cleaners, electric ranges or washing machines. Many a woman does without such an appliance because of the cost, though she really wants it. Perhaps often the husband is also sold on the idea and it is nothing but the money cost keeps him from having the article. There are cases of this kind in every neighborhood and the Christmas season affords an excellent time to run this prospective business into hard cash. Feature the appliances in the window with suitable cards and as well do personal work with the husbands of the women who are your prospects.

The Man's Gift

Women are always worrying about what they will give their fathers, brothers, or husbands. They really don't know what is suitable and they are grateful for guidance on the question. It has been found effective for the dealer to pick from his sales force a girl who can talk well and pleasantly over the telephone. She is delegated to the task of going through his list of customers and prospects and informing them that he has in stock an electrical device particularly adapted as a Christmas gift for a man. This device should be one which you yourself judge to be a good man's gift. You will find that such procedure is welcomed by many women as relieving them from the necessity of purchasing the conventional neck-ties and cigars.

Niagara Falls' Splendid Hydro Building

New Structure Combines Functions of Sub-station and Office— Provision Made for Appliance Selling— Is Fireproof Throughout

The combined sub-station and office building recently opened by the Ontario Hydro-electric Power Commission in the city of Niagara Falls, is an admirable example of this type of structure.

It is fireproof, being constructed throughout of reinforced concrete, and faced with No. 1 Milton rug buff brick, and Bedford gray stone. Ground line dimensions are 108 by 56 feet.

The station end of the building is approximately 67 feet. by 44 ft., a fire wall extending up from the ground to the roof between the office and station.

Incoming Lines

The two 12,000 volt incoming lines enter the building through roof bushings, each line being equipped with choke-coils, C. G. E. oxide film lighting arresters, disconnects and Westinghouse G. A. 3 oil circuit breakers and overload relays. From the oil circuit breakers each line feeds a 12,000 volt bus through disconnects, and from this bus the present 3 banks of step-down transformers are served. All the 12,000 volt equipment is located on the top floor, with provision for another line and future transformer breakers.



Niagara Falls, New Station and Office Building

The step-down transformers are located in the transformer room on the main floor. This room is equipped with a track and a 25 ton transformer truck, also a 15 ton Morris chain hoist. The present transformer installation consists of two 1500 kv.a., 13200/2300 volt, 25-cycle O.I.W.C. Crocker-Wheeler three phase transformers, and one bank of three 884 kv.a. 12000/2200 volt 25-cycle O.I.W.C. single phase Crocker-Wheeler transformers. The oil connections of all the transformers are connected through valves to a common header and a 2000 gallon oil tank in the basement. This oil tank is also equipped with a rotary hand pump, so that oil can be pumped to either of the two floors. The water piping is also connected to a common header, and is so arranged that water can be used from either the city mains or from their own cooling pond, located at the rear of the lot, by means of a Rees-Roturbo pump direct connected to a Westinghouse 7½ h.p. 3 phase motor.

The control-room is located on the main floor, and is approximately 27 ft. by 67 ft., and is the standard Hydro construction for 23,000 volt, remote control, with both main and emergency 2300 volt buses. All breakers on outgoing three phase circuits are C.G.E. K32 Type, 600 ampere, 15000 volt. At the present time there are three 3-phase power circuits, and four 3-phase commercial lighting circuits, and five series street lighting circuits feeding out of the station, with provision for three more power and two more commercial lighting circuits.

All 2300 volt feeders leave the station underground, and come up to the overhead lines at four different points, thus eliminating congestion.

Each feeder is protected with overload relays, and the power and lighting feeders each have their own graphic recording wattmeter, these together with the kilowatt hour meters on the station service and the street lighting feeder, make it very convenient for analyzing the load conditions.

The main offices and show-room are located on the main floor, the entrance being at the corner of Victoria Avenue and South Street, thus giving a large window on each street for display purposes.



The control room, located on the main floor of the building. There are three power circuits, four commercial lighting circuits, and five series street lighting circuits feeding out of the station.



Main offices and show room on main floor—lighting fixtures by Tallman Brass & Metal Co.

Each of these windows is equipped with two 75 ampere, 110/220 volt, polarity flush receptacles for the demonstration of ranges, and other appliances.

The lighting fixtures throughout the offices are semi-indirect, and were supplied by the Tallman Brass and Metal Co. of Hamilton.

All things considered, the new Hydro Building is one which the citizens of Niagara Falls can point to with pride.

The members of the Hydro-electric Commission of Niagara Falls for the present year are: R. J. Unsworth, Chairman; A. Zimmerman, and C. R. Newman; the chief executive officials are J. E. Teckoe, manager, and J. W. Bayliss, secretary-treasurer. The architect of the building was C. M. Borter, and the contractors were the Robertson Construction & Engineering Co., of Niagara Falls. The engineering and installation of all the electrical equipment, was handled by the Hydro staff.

"Finest Plant in the North Country"

The above is a quotation by a prominent electrical man regarding the hydro-electric development of the Abitibi Power & Paper Co. at Twin Falls, Ont. Read the article describing this plant elsewhere in this issue.

The Florence Power Light and Milling Co., Ltd., has been dissolved.

Instalment Plan Sells Many Radio Sets

Gibson Radio Supply Have Adopted A Plan That Brings Business From The Working Man

High prices have been one of the difficulties of radio selling in the past. This did not prevent thousands upon thousands of sets being sold, but every radio man who came into contact with the public could not but feel that a vast potential market was not available because the price of reliable sets was more than many people could part with at a single time.



A specimen advertisement

The idea that people in this position should build up their own sets from cheap parts is not the best solution, for various reasons. In the first place, if good parts are used, the price is not much less than it would be for a complete set. In the second place, cheap parts are never satisfactory, and the radio dealer can not expect much goodwill from their sale. Then again, there is a large percentage of would-be buyers who are not mechanically inclined, and at the same time would like a set at a reasonable price. To meet this situation, Mr. G. V. Gibson, proprietor of Gibson Radio Supply, 104 King Street, West, Toronto, has evolved a plan of selling radio on the instalment basis.

The ideas mentioned in the first part of this article had been occurring to Mr. Gibson for some time, and he finally decided to give the easy payment plan a tryout.

The adoption of this scheme was announced with the use of liberal space in the newspapers. Advertisements similar to the one shown herewith, were used, occupying 195 agate lines. This covered most of the local territory.

Previous to the public announcement of the scheme, details of its operation had to be carefully worked out. These matters included the preparation of a lien form, and a blank for particulars to be filled in at the time of sale. The initial payment was fixed at $10.00 because this amount pays for the tube and batteries, and there is no great loss if the set has to be taken back. Mr. Gibson points out that with his plan every sale of this kind is pretty well secured; two references are required from everybody, and in the case of minors, a guarantor is necessary.

So far the clerical work in this connection has

No 1250 Toronto, ... 192...

$.

FOR VALUE RECEIVED I promise to pay to the order of GIBSON RADIO SUPPLY (hereinafter called the Vendors) at their Store, 104 King St. W., in the City of Toronto, Ont., the sum of $..... payable as follows:

$..... cash with this order, balance

In weekly payments of $ .....per week. In monthly payments of $ ..... per month.

Due on the ..... day of each ..... hereafter until paid in full with interest on each instalment from date hereof at the rate of .....% per annum before and .....% after maturity.

This lien is given for the purchase of the following property purchased by me from the said Vendors:

The title to, and property in, the said Radio Equipment purchased by me shall remain in the Vendors or his assigns (but at my risk in case of loss, destruction or injury) until payment in full of this lien note and also interest as aforesaid, and in the event of default in payment of any part thereof, all the unpaid instalments shall at once become payable with interest as aforesaid, and the said Vendors or his assigns may repossess the said property and thereupon proceed in accordance with the provisions of the Conditional Sales Act, and all payments made shall remain and be the property of the Vendors as rental for the use of said Radio Equipment

The undersigned hereby agrees not to move the above property from the address given below without the consent of the Vendors.

The purchaser hereby agrees that the Vendors shall be under no liability for any error in description of property herein contained NO SALESMAN OR AGENT IS AUTHORIZED TO MAKE ANY PROMISE, VERBAL OR WRITTEN, OUTSIDE OF WHAT IS CONTAINED IN THIS NOTE, OR IN ANY WAY TO ALTER THE SAME.

It is hereby admitted by the undersigned that a copy of this lien note has on the date of the date hereof been delivered to the undersigned.

..... Signature of Purchaser .....
(Signature of Witness)

..... Address of Purchaser .....

.....
Salesman

Lien form signed by the customers

PARTICULARS TO BE FILLED AT TIME OF SALE.

Married or Single .....

Occupation (or that of husband) .....

Where employed .....

Do you own Real Estate? .....

Do you carry Insurance? .....

Give TWO References:—

1 Name .....

Address .....

2. Name .....

Address .....

NOTE: Any purchaser not of age must have the guarantee below signed by parent, guardian, employer or other responsible party, 21 years of age or more.

FOR VALUE RECEIVED, I hereby guarantee the payment to you of the price agreed to be paid for the property as described on the reverse side in accordance with the terms stated in the lien note given by the Purchaser to the Vendor, as described on the reverse side.

Date..... Signature .....

..... Address .....
Witness

Form showing particulars obtained

been handled by the regular clerical staff, the task being simplified by having each sheet numbered. Results are fast coming in, and Mr. Gibson states that this is because the workingman can now afford to buy a set of sufficient quality to give him satisfaction.

Aside from the radio instalment plan, there are other features that make Gibson Radio Supply a busy place. For one thing, the radio fan can buy almost any accessory on the market. "Everything in Radio" is a slogan that is lived up to, and the result is big business from those fans who demand parts of a certain specified kind. Everything is carefully examined before it goes out of the store and there is small chance of a customer getting a defective part.

Mr. Gibson believes in aggressive merchandising. He advertises constantly in the daily press, and uses the direct mail method at regular intervals. Window and store displays are arranged with attention to detail, every display having a selling idea.

Canadian Radio Helps Lloyd George

The recent visit to Montreal of the Rt. Hon. David Lloyd George meant much to the radio industry, in that it afforded radio a great opportunity of performing its wonderful functions in two ways. The Northern Electric Company while helping the speaker and his listeners in the Arena, saw to it that radio listeners on the outside were given an opportunity of sharing in the great event for when it was known that the famous speaker was to visit the metropolis this company promptly offered its equipment, both its Public Address System and Broadcasting, which equipment in the first place enabled some eleven thousand people who packed themselves into the Mount Royal Arena to hear distinctly every word uttered on that memorable occasion and, by broadcasting the speech, many more thousands were enabled to hear the famous statesman from the outside.

Previous to the meeting on the afternoon of Monday, October 8th a private demonstration of the Public Address System was requested by Mr. Lloyd George who expressed himself as being very well satisfied with the result and was responsible for the statement that if the people who would assemble in the arena a few hours later could hear as he himself had heard, he could assure the Northern Electric Company that the equipemnt would be used quite extensively in England at a future date. The success of the equipment was manifested in the columns of the press in reporting the meeting and afterward by Mr. Lloyd George himself who stated to the newspaper men that he owed the success of his monster meeting to the Public Address System.

When the former Premier of Britain left Montreal for Ottawa on Wednesday, October 10th, the Canadian National Railways equipped his special car with a receiving set and supplied artists to attend the Northern Electric studio at Station C.H.Y.C., where a programme was broadcast in which a farewell address was delivered by vice-president Robb and latest cable despatches were read. The cable items made history for radio. They came from London, Paris, Berlin and Washington, and one in particular calls for special mention in that Washington cabled a press message to the effect that President Coolidge wished it to be known that the Hughes proposals still held good in regard to U. S. participation in adjustments; this so interested Mr. Lloyd George that before he left the train at Ottawa he called in the newspaper men and passed on his comments on Mr. Coolidge's statement embodied in the cable received by radio during his journey, with the result that Mr. Coolidge replied to Mr. Lloyd George through the columns of the New York press the following day. This for the first time in history had two statesmen exchanged views on a vital world problem through the medium of radio. To these same reporters Mr. Lloyd George again referred to the Public Address System and stated that his voice had been spared and that through the aid of the amplifiers he had been enabled to reach eleven thousand people at the monster meeting held in Montreal.

People Hate to Read But They Like Pictures

Display a number of showcards in your window. the only wording on each being "For Mother," "For Father" and so on. Under the wording paste a picture cut from a magazine, showing a typical mother or father. Then underneath this paste pictures of suitable articles, clipped from catalogues. Pictures are easily assimilated, and this type of card is effectipe with people who do not bother to read showcards.



Some of the staff of the Ideal Electric Co., Hamilton, Ont., in a rare moment when they had time to pose

A Page of Radio Retail Advertisements

Get Ready to Tune-In
For the First Local Concert

RADIO

These Dealers Will Supply You
With the Best in Sets and Parts

THE RADIO SEASON IS HERE

"IF IT'S RADIO OF QUALITY—WE HAVE IT"

FOR PARTS OUR STOCK IS COMPLETE

In Receiving Sets we carry only the best, put up by Standard Manufacturers These sets will be serviced by us and guaranteed to the limit

There is a set made or we will make it to suit your price and fill your requirements

Ask Us for a Demonstration

WELCH & JOHNSTON
ENGINEERS

474 BANK ST
OTTAWA

PHONE
C 143.

THE studios of the "radio" theatre will be formally thrown into service for Ottawa radio enthusiasts with the presentation of the opening concert by "OA," the broadcasting station of the Department of Marine and Fisheries 379 Wellington street. How many the movies or fans of the city will "sit in" to a free entertainment without stirring from their own homes and at brief intervals during the coming months local concerts of unusual merit will be provided to delight the people. There are approximately 1,000 receiving sets in Ottawa this being the number registered with the department. Incidentally new enthusiasts should remember to secure a certificate of registration from Room 236 Bonner Building, or from the General Post Office.

In addition to the Ottawa concerts radio lovers are afforded the enjoyment of receiving in wonderful programmes from many distant stations such as Schenectady, Springfield, Mass., Montreal, Davenport, Iowa, New York City, Newark, Pittsburg, Detroit, Chicago and elsewhere. There is a wide choice of fine entertainment in the air every evening and much that is educative is also broadcasted. A unique fact is that Havana, Cuba is frequently heard by Ottawa radiophiles.

Local arrangements are well organized under the direction of the Ottawa Amateur Radio Association and with the supervision of the Department of Marine and Fisheries, the latter having all equipment necessary for efficient broadcasting.



Station "OA", Ottawa, Canada

NOW GET READY — BRING OUT YOUR SET

IF YOU ARE IN NEED OF ANY PARTS — WE HAVE THEM

U V Sockets, 15c, Ariel Insulators, 10c, Galena, 25c, Crystal Detectors, 50c, Switch Arms, 15c, Dials, 15c Contact Points, 2 for 5c Peanut Valves, Northern Electric, $5.00, Plate Batteries, $1.95, Radio Maps, 10c, 2 for 35c, C G E Special One Tube Set, $16.75, $20, and $100 Varicouplers, $2.50, Varimeters, $3.00 Variable Condensers, $2.50, Magnet Wire, Fibre Tubing Panels Cabinets, Complete Stock of Federal Sets and Parts

380-384 BANK STREET
Opp Lewis St

C. G. E. ELECTRIC WORKS

PHONES
Queen 885
Queen 5924

WHEN YOU THINK OF RADIO—THINK OF US

WE REPAIR EVERYTHING ELECTRICAL

RUSONITE
CRYSTAL ELECTRIC
FULL POINT
(Patent Pending)

A SYNTHETIC CRYSTAL DETECTOR SENSITIVE OVER ITS ENTIRE SURFACE

Eliminates all detector troubles. Extraordinary clearness and volume. Endorsed by Radio experts and press. Sold in Sealed Packages only. Join the ever-increasing Rusonite fans.

PRICE, POST PAID, MOUNTED SENSITIVENESS GUARANTEED 65c
RUSONITE CATWHISKER, 14 Karat Gold Multipoint contact, super-sensitive 35c

Dresden Mairhead Tone Radio Phones $7.00. V. T. U. valves $7.50. Northern "peanut" valves $5.00. Write for our price list of guaranteed Radio supplies. "RADIO" Atlas of the World 50c.

RADIO DEPARTMENT

Photographic Stores
Limited
65 Sparks Street
Ottawa

Before Buying a Radio Be Sure and
Ask Us for a Demonstration of the Famous

Fada Neutrodyne Receiver

For volume, tone and simplicity of operation it is unequalled.

No time wasted "fishing" for stations. You know where they are and can turn to them in a couple of seconds. Outside or inside aerial. If you wish to build one yourself we supply the parts with complete instructions.

The Music Master Loud Speaker

for perfect tone and wonderful volume. No additional batteries required.

Complete line of standard parts and accessories

Sets built to order. Information and advice gladly given

Sub-Agents Wanted Throughout Eastern Ontario

WHITCHER & CO.
197 BANK STREET PHONE Q. 7051

At Last! The SET You Have Been Waiting For

CROSLEY "ACE"

Includes Detector, Tuner, Tube Batteries, Phones, Aerial, Lead In and Ground Wire etc. All complete to listen in

COMPLETE
$45



WE CARRY ALL PARTS IN STOCK

JONES BROS.
203 RIDEAU STREET R 1121

RADIO

All over the country people are taking advantage of this great discovery. They are "listening in" on the best music, the latest news, the finest lectures and the field is being rapidly widened.

When you get your radio for the best We have it.

We carry a complete line of radio supplies.

Receiving Sets built and re-built

Is your Radio Set giving you satisfaction? If not, bring it in to us—we will reconstruct it

RADIO SERVICE STATION
Certified Radiorician in charge
Bring your Radio troubles to us

A. H. BERTSCHINGER
Queen 572 76 QUEEN STREET

Program

The radio programme Saturday evening from "O A" broadcasting station will be as follows

1 Children's Story — Uncle Jack
2 Orchestra Selection — Tipping Orchestra
(a) March, "Electric Girl" (Holmes)
(b) Waltz, "Wonderful One" (Whiteman)
3 Contralto Solo — Mrs McCulloch Allen
(a) "Less Than the Dust"
(b) "Kashmiri" (From Indian Love Lyrics)
4 Quartette, Selection from "The Jolly Rogue" (Candlish), Bethany Male Voice Quartette
5 Voice Quartette (5 Maidens, 1st tenor, A. Wimperis 2nd tenor A. Burke, 1st bass J. A. Lee, 2nd bass.
6 Pianoforte Solo — Miss Helen Rea
7 Contralto Solo — Mrs M. Culloch Allen
Melisandi in the Wood" (Goetz.)
8 Orchestra Selection — Tippins' Orchestra
(a) Spanish Serenade, "Anita" (Hillion.)
(b) See It With the Ukulele (Conrad)
9 Soprano and Baritone Duet — Mr. and Mrs. H. Butler
10 Quartette — Bethany Male Voice Quartette
"Mosquitos" (Bliss)
11 Orchestra Selection — Tipping Orchestra
"Last Night on the Old Back Porch" introducing "Chickadee" (Brian.)
12 Quartette — Bethany Male Voice Quartette
"O Peaceful Night" (German)
13 Pianoforte Solo — Miss Helen Rea
14 Soprano and Baritone Duet — Mr and Mrs H. Butler
15 Orchestra Selection — Tipping Orchestra
(a) "Love Sends a Little Gift of Roses" (Openshaw)
(b) "Canadian Patrol" (O'Neill)
16 Quartette — Bethany Male Voice Quartette
"The Apple and the Worm" (Bittle)
17 Orchestra Selection — Tipping Orchestra
(a) "Old King Tut"
(b) "Medievana"
(c) "International" (By request)
Dr. J. W. Robertson will give a short address on "The Health Movement in Canada."
O Canada — Accompanists, Mr H. Bramwell Bailey, Mr J. A. Lee
GOD SAVE THE KING

For the Radio Fan

Pick Your Pleasure
Out of the Air

We have a new line of radio supplies of the latest up-to-the-minute at astonishingly low prices



The person who owns a radio set is a happy individual. He hears sports, the latest news and the latest orchestral numbers as he sits back and call

We have been appointed distributors for Northern Electric Radio Supplies

See us on Peanut Tubes, new price $5.00.
Full stock Radio Parts, Federal and Northern Electric.

PLAUNT HARDWARE CO.
197 Sparks Street. Phone Q. 4642



RADIO

BATTERIES CHARGED AT Reasonable Rates

24 HOUR SERVICE

If you want to get the best results from your Set have your Battery charged at regular intervals

WE WILL CALL FOR YOUR BATTERY AND DELIVER IT

WHEELER BROS.
778 BANK STREET
Near Third Ave
Phone C 2619

You Can Add Life to Any Radio Set With a Hart Battery

A SPECIALLY BUILT battery with elements particularly suited to give true voltage curve required in radio practice.

The Hart radio battery provides the steady uniform current flow so necessary for receiving orchestra and band music.

PRICES—6 Volts			
"Radio 40"	$16.00	"Radio 80"	$25.00
"Radio 60"	$18.50	"Radio 120"	$35.00

Four volt batteries can be supplied at 25% below the six volt price.

REPAIRING RECHARGING STORING

We call for and deliver all orders.

THE RIDEAU BATTERY SERVICE & IGNITION CO.
PHONE R 49 265 RIDEAU STREET



The Joys of Radio

The whole world comes to entertain and instruct you through Radio. A different programme of enjoyment is yours every day—that's why you can never tire of it. Radio is a never-ending thrill, a terrific lot of fun.

Radio Receiving Sets and Equipment for Building Your Own

Crystal Sets, $13.50, also Crystal Parts
Federal Loud Speakers $24.50
Battery Chargers, $22.00
Federal No. 57 Receiving Sets
Canadian Senior Valve Sets

We install Receiving Sets erect Aerials and do Radio Repairs of all kinds

Garrioch, Godard & Co.
11 ELGIN STREET Queen 1066

RADIO

TUNE IN FOR
STORAGE BATTERIES
Willard
RADIO PROGRAM
WTAM Cleveland

Wednesday Evenings at 8
Saturday Evenings at 8.

We have recharging rate to suit every purse

See our special 6 volt valve set at $75. Phones and equipment extra. Best value on the market

RADIO SETS AND SUPPLIES

Federal, Westinghouse, Atwater-Kent, Michigan, Ace, Valley Battery Chargers, Willard A & B Batteries, Head Sets, Valves etc. Dictagraph and Thorophone Loud Speakers

Battery & Ignition Service Co., Ltd.
284-290 SPARKS STREET PHONE Q. 509

At the opening of broadcasting station "OA" in Ottawa, local dealers got together and used a page of advertising in the Ottawa Journal, reproduced above

Getting the Most Out of Advertising Space

Editor, Electrical News:

I had the occasion to be speaking to a young lady who has charge of the electrical department in a large departmental store. As she had been asked by her manager to "make an ad," she looked around to see what line of goods she would use. After a few minutes survey of the stock on hand, she hit on portable heaters of which there were six different kinds ranging in prices from $6.75 to $10.50. I suggested that she give a few details as to their use, convenience, cost of current, etc., but she answered that the advertising department would "write it up."

Now, with all due respect to the "ad writers," no one person can write "ads" with full pulling-power for over seventy-five different departments without some assistance from those who are best acquainted with their own lines. The "ad" in question was inserted in a "Daily" and merely mentioned that they had a complete line of portable heaters priced from $6.75 to $10.50. Being an electrical salesman myself, in the retail business, I know from experience how badly informed the Public is "electrically," and many good prospective customers imagine that the use of electrical appliances would raise the power bill beyond their means. Because we know ourselves the cheapness, convenience and usefulness of the many labor saving appliances now on the market, we must not take it for granted everyone else does too, but instead should take every means in our ads, and elsewhere to educate the public in an easy and indirect way. Therefore if, when writing an ad, we would try to get our full money's worth out of it by mentioning that the cost of a 600 watt heater at the local net rate, say 5 cents per kw. hour is only 3 cents an hour, that an electric flat iron or toaster (using 500 watts) costs 2½ cents per hour, that an electric washer or vacuum cleaner use less than an iron,, while a curling tongs use no more than an ordinary 50 w. lamp, and so on.

We can also call their attention to the fact that these appliances require no special wiring but can be used on any lamp socket or wall outlet with perfect safety.

Unless we keep these ideas in mind and use them in our ads, we are not getting the most for our money from our advertising space.

"Shorty"

Business Notes

N. H. Knoll, electrical contractor-dealer, is opening a store and will carry on a contracting business at Chippawa, Ont.

The stock and fixtures of the St. James Electric Co., St. James, Man., have been sold to the Bengie Electrical Company.

The National Electric Contracting Company, Ltd., has obtained a charter in Montreal.

The Lightolier Manufacturing Co., Ltd., Montreal. Que., has changed its name by letters patent to Electrolier Mfg. Co., Ltd.

W. N. Smith Battery & Ignition Co., Ltd., has recently been incorporated in Toronto.

The Upper Electric store at 819 Ferry Street, Niagara Falls, Ont., formerly operated by Mr. B. E. Upper, has been purchased by the Stamford Hydro-electric System. The store has a good location and is well stocked with electrical appliances. The manager is Mr. L. L. Craig, a well known electrical man.

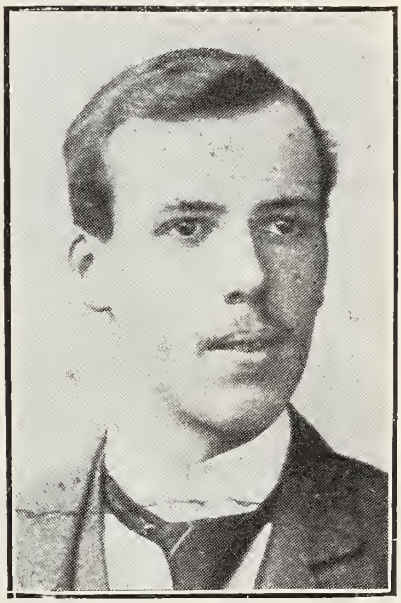
Prominent Electrical Contractor Dealers

— 14 —

L. H. Lander, Hamilton

An experience of fifteen years in the electrical business in Hamilton, Ont., has made L. H. Lander well and favorably known to members of the trade in that vicinity.

Mr. Lander was born in England, and it may be surmised that the training he received in that country proved a good foundation for his present success. He



L. H. Lander

was works manager for a big concern over there and when he decided to move to larger fields in Canada, his experience was a valuable asset on which there was no transportation charge.

A short interval saw him comfortably settled in Hamilton, busily engaged in wiring. Hard work, and a desire to turn out the best that was in him, soon gained him a reputation, with the result that his circle of customers has ever been increasing.

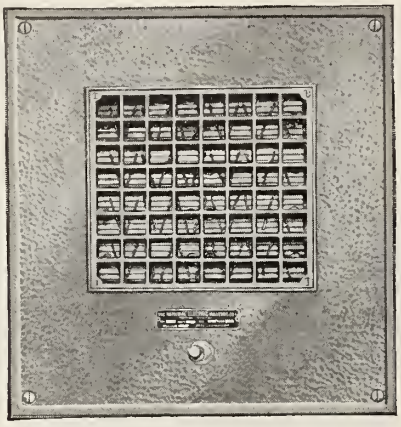
About a year ago Mr. Lander moved from a downtown location to his present stand at 3 Proctor Boulevard. Here he has a nicely laid out store, with plenty of room for appliance and fixture display, and two big windows for that part of appliance merchandising.

At the moment the main business of this contractor-dealer is wiring, and he has a very fine connection on that line. However, Mr. Lander is a believer in all parts of the electrical business, and his square methods have won him a reputation that extends far and wide.

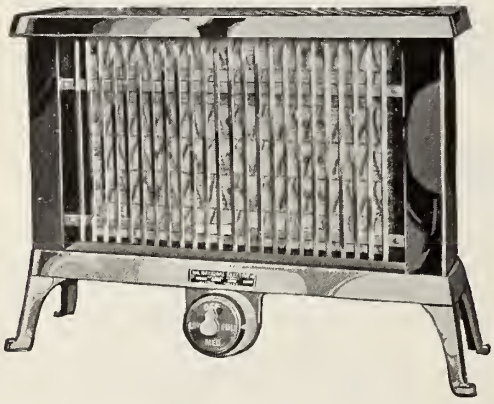
The Latest Developments in Electrical Equipment

New National Heaters

Among other new models, a flush wall heater of interesting design, is being placed on the market by the National Electric Heating Company, Toronto. This heater fits flush into the wall of bedroom, bath-



room or other room where auxiliary heat is essential, and floor space limited. Two finishes are employed, polished nickel and white enamel, the latter being designed especially for the tiled bathroom. Dimen-



sions are 16 in. by 17 in., single heat, 1000 watt capacity, tumbler switch control. Another addition to the National line is the radiator type heater, pictured in the second illustration. Base, radiator top and element guard are finished in polished nickel. Control is obtained through a three-heat reciprocating switch. Wattages vary in different models from 1000 watts to 4000 watts, and dimensions from 17¾ in. by 15⅝ in., to 21¾ in. by 26¾ in. There are five models of this radiator type heater.

Switch Dial Decade Testing Set

A switch decade testing set for use by testing engineers of public utilities, which can also be used by other persons engaged in resistance measurements, has recently been brought out by Thompson-Levering Company. This device operates on the Wheatstone bridge principle and has in its rheostats four dials with coils of the value of unit, ten, hundred and thousand ohms, nine coils to each dial. Control is



obtained by a single multiplying dial which gives a range of from .001 to 1000 times the rheostat reading. A complete set of ratio coils to give the correct ratios as the brushes are revolved are provided with the bridge, which makes a two-arm bridge, operated by a single multiplying indicator.

Control-A-Lite Switch Stem

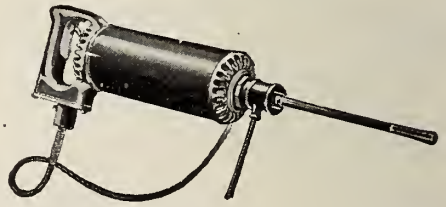
A 660 watt switch stem with a quick make-and-break mechanism has recently been put on the market by the Electrical Dealers' Supply House. It is made in one unit and, it is claimed, may be pulled from any angle, with no arms to be adjusted. The



device is made in three different sizes, the insulated type, the non-insulated type complete with blind coupling, both of which are equipped with wire guide, and the non-insulated type, a cut of which is shown, in a horizontal position.

Electric Hammer

Electrical contractors, plumbers, steam fitters, and many others who work on present day fireproof structures have been greatly handicapped in sinking holes, channeling, remodeling, etc., in concrete, stone or brick because of the lack of a portable power tool.

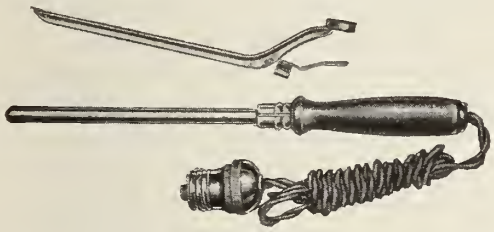


To fill this need, the National Electric Manufacturing Company, has quite recently brought out the "Syntron" electric hammer. This device is rugged in construction and has but one moving part, the tool

steel piston, which moves back and forth in synchronism with the frequency of the supply voltage, striking the drill or chisel 3600 blows a minute when used on a 60-cycle current. It may be operated from any convenient lamp sacket.

Improved Curling Iron

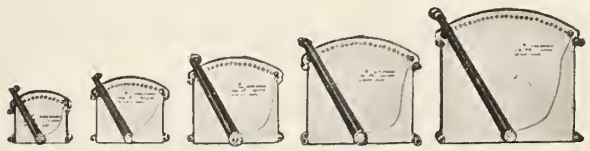
H. R. Reed, 81 Victoria Street, Toronto, handling the Security line of electrical appliances, reports that several novel features of the Security curling iron have attracted wide attention in the trade. Among these may be mentioned the swivel connection on the handle which absolutely prevents any twisting of the cord. Another feature is the holder supplied, which clips anywhere, as on the side of the dressing table,



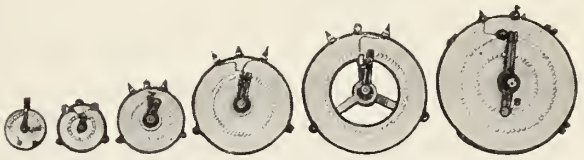
keeping the curling iron out of the way when not in use. The element for this iron is wound on a lava tube with special asbestos insulator which makes short circuit impossible. The iron comes completely equipped with 6 foot cord and standard two piece plug, and is guaranteed for one year.

Increased Line of Vitrohm Plate Rheostats

The Ward Leonard Electric Company of Mount Vernon, N. Y., has increased its line of Vitrohm



(vitreous enamelled) cast iron type of variable rheostat plate by adding new sizes of plates. The field now covers from a 5½ in. square to a 14 in. square plate. They also include in the line of larger plate in standard size 15 in. x 24 in. The round type of plates are made in sizes from 5 in. diameter to 19 in. diameter. On these plates a straight same



ampere capacity of resistance throughout is used for motor armature control—a two to one taper to eight to one taper for generator and motor field control.

Give Him Lots of Rope

An employee trying to make good should be given plenty of rope. If he is made of the wrong stuff he'll hang himself with it. If he's the right kind he'll make a ladder of it.—Exchange.



A Condensite Celoron Window

The accompanying photograph was made of an interesting display recently staged in the window of the Whitman Radio Co., Ltd., Montreal, Que. Believing in the principle that the full force of a window display is obtained by concentrating on one subject, the designer of this window devoted the whole showing to Condensite Celoron, showing component parts, and panels, for radio sets. Several finished sets were also included in the window. The store manager states that the display proved a drawing card for radio fans.

Current News and Notes

Brockville, Ont.

Brockville ratepayers will vote January 1 on a by-law re spending $13,000 on gas engines for the power station.

Bryson, Que.

Work will soon start on the development of Ottawa River Power Company, at Bryson. Dr. L. A. Herdt is buying the electrical machinery, Wm. Kennedy & Sons are looking after the hydraulic machinery.

Drummondville, Que.

The Drummondville Textile Co. have now installed twenty-four motors and two hundred electric lights. This is a new industry for the town.

Essex, Ont.

A transformer suffered some damage recently in Essex, Ont., and all electric lights were off for a couple of days. A local dispatch in regard to the situation states: "Citizens realize more than ever the value of electric lights when they have to turn to the old-fashioned lamps for illumination. Stores are closed evenings because of the lack of lights."

Fort William, Ont.

William Sutton, Fort William, Ont., has achieved a wide range with his radio transmitting set. He has been picked up by J. A. Partridge of London, England, and by the McMillan Arctic expedition.

Hamilton, Ont.

Addressing a large audience of employes on Nov. 7, in the Canadian Westinghouse company's auditorium at Hamilton, Ont., Emil Loos, assistant manager of sales, and H. A. Cooch, sales engineer, presented two exceedingly interesting talks on the various phases of sales work.

Jonquiere, Que.

The Canadian General Electric Company are supplying the generator for the hydro-electric development at Jonquiere, Que.

Kingston, Ont.

Telling the Kingston Hydro Power Commission that at the present rate of natural increase their total supply of electric power would be consumed in two years' time and that all the standing provincial sources would be taxed to the limit of their capacity by 1923, Sir Adam Beck, chairman of the Ontario Hydro Commission, issued a warning that either the industrial load must be kept stationary or the domestic consumers will be made to suffer.

The occasion of Sir Adam Beck's pronouncement was the visit of a committee from the Kingston Hydro Commission with the request that they be granted their share of the power increase which will naturally accrue to them from the additional installations now under way in the central Ontario system, without being tied down by the condition that the increase be allotted to household use rather than industrial use. Sir Adam finally agreed that the matter of how the power increase to be granted Kingston under the system of distribution that was to be worked out, would be left entirely in the hands of the Kingston commission.

Kitchener, Ont.

The Dominion Government meteorological department will install an electrical apparatus in Kitchener, Ont., for measuring rainfall.

That the claims of the city of Kitchener to one of the proposed new steam plants of the Hydro Commission be placed before the commission by the Industrial Committee of the City Council in co-operation with the Board of Trade was the substance of a resolution passed by the City Council in session on Nov. 19.

London, Ont.

A price of $1,400,000 placed by the London Street Railway on its assets, has been rejected by the city as too high.

Montreal, Que.

An unconfirmed report states that plans are under way for the development of power on the Riviere du Loup, County of Maskinonge, about 70 miles northeast of Montreal.

The power site to be developed is located near St. Paulin, in the County of Maskinonge, and involves the construction of dam and power house to produce 21,000 horse power at once, which could be considerably augmented by later extensions. It is stated that the plans are being worked out by a group of financial men closely associated with Montreal Tramways.

Operating profits of the Marconi Wireless Telegraph Company of Canada, Limited, for the year ending December 31, 1922, amounted to $22,251, as compared with $12,253 in the previous year and $69,906 in the year ending December 31, 1920.

The name of the Central Quebec Power Company is being changed by supplementary letters patent to the Algonquin Power Company. This change follows the recent announcement in the Quebec Official Gazette to the effect that the capital of the company had been increased from $1,000,000 to $2,000,000.

New Glasgow, N. S.

Members of the Town Council of New Glasgow are dissatisfied with the progress made by the Pictou County Power Board, and will ask for a definite report covering what has been done for securing pub-

lic distribution of hydro electric power from the Malay Falls development.

Ottawa, Ont.

Mr. E. B. Myers of the E. B. Myers Co., Ltd., Montreal, Que., recently lectured on radio to a large audience in the auditorium of the Victoria Museum, Ottawa.

Although no alarm has been occasioned in official circles in Ottawa by the reported announcement from Washington that the War Board would not now consider any applications for further diversion for power purposes of water from the Niagara River or elsewhere, it was pointed out by Hon. Charles Stewart, Minister of the Interior, that if power requirements continued to increase at their present rate it would compel a reconsideration on the part of the four parties to the power treaty—the United States, New York State, Canada and Ontario—of the diversion limitations provided in that pact.

According to the treaty the present diversion limitations of the United States at Niagara Falls is 20,000 second feet and of Canada 36,000 second feet. In both cases the limit is nearly reached now, and, as a matter of fact, by its interpretation of the treaty, the United States Government has permitted the Niagara Falls Power Company an additional diversion of 20 per cent., making the total 24,000 second feet. By the same interpretation Canada can divert 43,000 feet.

With the idea of bringing about a co-operation that would ensure the most economical use of the water now flowing in the Ottawa river, the various owners of water rights at the Chaudiere Falls have reached an agreement wihch will increase the total power available. Under the plan, agreed upon at the time of day when the demands for power are heaviest, water properly belonging to owners on this side of the Ottawa river is turned over to the Hull side, because of the higher head at the plant of the Ottawa and Hull Power and Manufacturing Co.

Oshawa, Ont.

Headed by Mayor W. J. Trick, an Oshawa deputation waited upon the Ontario Provincial Hydro-electric Commission on November 14, seeking additional power supplies. The increased demand, it is said, is mainly from Oshawa's growing industries. Oshawa, it was pointed out, has no auxiliary plant in case of shortage or breaks.

Port Arthur, Ont.

In a recent interview with a deiegation of citizens, Sir Adam Beck stated that Fort William would be given whatever power was avaailable. This will run (until further development is made at Nipigon) from 1,500 to 3,000 horsepower, and should it not cover the shortage likely to develop by reason of failure of the Kaministiquia water supply the only further alternative will be for Fort William to produce it by means of a steam plant. Such power as Fort William gets from Nipigon in the immediate future will have to be through Port Arthur lines. At a banquet in the evening Sir Adam Beck announced that negotiations had been opened for the taking over by the Hydro of the Kaministiquia Power Company.

Quebec, Que.

Reports state that the series of falls known as Grand Calumet, on the Ottawa river, are to be dammed and 50,000 horsepower harnessed as a result of negotiations, which have been in progress between various Quebec and Ontario private interests and have now come to a satisfactory conclusion.

From available information, the works should start early next spring and when completed mean an expenditure of between $3,000,000 and $4,000,000. Only a small portion of the 50,000 horsepower available will be utilized in the province of Quebec as far as can be ascertained, the larger portion of the output to be disposed of in the province of Ontario.

Regina, Sask.

A recently appointed member of the staff of the telephones department, Saskatchewan government, is Miss H. M. White. Miss White is a native of Pictou county, N. S., and took her course in arts and engineering at Dalhousie University, Halifax, graduating in 1921.

St. John, N. B.

The New Brunswick government has retained H.G. Acres, of the Ontario Hydro Commission, to report on the advisability of developing the hydro electric possibilities at Grand Falls, the water power rights to which were taken from the International Paper Company. Mr. Acres will visit Grand Falls in the near future, and make an exhaustive survey.

The New Brunswick Electric Power Commission's development on the west branch of the Musquash River, which has not been functioning since the floods destroyed a dam there last spring, was put back into operation on November 12, following the completion of repairs and the accumulation of water in the storage basin.

St. Mary's, Ont.

A $10,000 extension to the lighting systems of St. Mary's, Ont., is contemplated.

St. Narcisse, Que.

A report states that plans are being prepared for a 5,000 h.p. power plant at St. Narcisse, Que., on the Batiscan River.

Timmins, Ont.

Tenders are being called by Hollinger Consolidated Gold Mines on their Timmins sub-station. Tenders are wanted on erecting the steel tower transmission line from Island Portage to Timmins.

An open autumn has enabled work on Hollinger's pewer development at Island Falls to be pushed so successfully that the big dam will probably be finished in time to enable installation of equipment to be completed before end of next summer.

Gross earnings of the Northern Canada Power

Company, Limited, for the month of October amounted to more than $72,000, this being the heaviest gross for a single month in the history of the company.

Toronto, Ont.

Hydro towers will be moved northward from their present location at Sunnyside, Toronto, by the Harbor Commission.

Over 100 delegates came to the 18th annual convention of the Canadian Independent Telephone Association held in Toronto, Ont., recently.

Winnipeg, Man.

Showing a surplus of $14,609 for the year 1922, Winnipeg Hydro-electric system has still taken funds enough out of earnings to build up a sinking fund and depreciation account, the latter amounting to nearly $2,250,000, and has created a revenue surplus of more than $200,000.

Wiring Contracts Awarded

Antigonish, N. S.

Antigonish Electric Co., office on Main St.

Brockville, Ont.

A. G. Dobbie & Co., $5,000 house on Murray St.

McEvoy & Co., $6,000 duplex residence corner George & Gilmour St.

Birchcliffe, Ont.

Chas. H. Dowling, 59 Duvernet Ave., 2 houses, $4,000 each.

Brantford, Ont.

E. W. Litzer, 39 Elgin St., $4,000 house at 116 NelsonStreet.

Thos. Minnes, $15,000 warehouse, office and garage.

Blind River, Ont.

Greenwood Electric Co., Sault Ste. Marie, Ont., rebuilding hotel on Lakeside Ave., $6,000.

Cooksville, Ont.

H. V. Moore, 3 houses $5,000 each.

Drummondville, Que.

Thos Fournier, $3,000 repairs to hotel.

Dunnville, Ont.

Harry Foster, $4,000 house on John St.

Edmonton, Alta.

Economy Electric Co., $75,000 new Nurses' Home, at Royal Alexandra Hospital.

Grantham Twp., Ont.

C. Widdicombe, St. Catharines, Ont., residence on Niagara St.

Hamilton, Ont.

Wm. Thornton, Weir St., 3 houses, $6,000, on Tuxedo Ave.

Kingston, Ont.

J. Harris, 4 Cooper St., $103,000 addition to dormitory, Royal Military College.

Montreal, Que.

O. Labelle, 347 Addington, $7,500 house on Wilson; $7,500 house on Harvard Ave.; 2 houses $15,000 on Vendome; 2 houses, $15,000 on Cote St. Antoine; $18,000 cottage on Girouard Ave.

Globe Electric Supply Co., Ltd., $6,000 garage corner Fairmount and St. Lawrence; $60,000 apartment house near 462 McKay St.

J. S. Drummond, 467 Old Orchard Ave., 4 houses, $25,000, on Old Orchard between Monkland and Terrebonne.

Booth Bros., residence (2 flats) $8,000 on Walkley Ave.

Vincent & Say, addition to store at 572 St. Catherine St. W.

J. A. St. Amour, 2171 St. Denis, $60,000 house corner Robin and Amherst.

Crown Electric Co., $6,000 addition to hotel at 17 McGill College Ave.

J. W. Tousignant, 637 Marie Anne St. E., $30,000 building on Mt. Royal Ave. East.

New Hamburg, Ont.

Geo. Morley, $8,000 business block.

Outremont, Que.

H. Lamarre, 2015 Chabot, $9,000 cottage on Dunlop near Van Horne.

J. W. Tousignant, 637 Marie Anne St. E. Montreal, $20,000 store and apartment.

Ottawa, Ont.

Wallace Chugg, Bank and Fourth Ave., $5,500 house on Ossington Ave.

G. Young, Spruce St., house on Somerset St.

E. Headley, 44 Hopewell Ave., $6,000 house on Ossington Ave.

Art Davis, Bronson Ave., $9,000 house on Clemow Ave.

J. A. Ellacott, Bank and Strathcona Ave., $5,000 house on Seneca St.

H. L. Allen, 272 Bank St., $7,000 double residence on Warren Ave; $6,500 house on Sunset Blvd.; $5,000 house on Sunset Blvd.; $18,202 addition to chemical laboratory.

St. Catharines, Ont.

J. Beatty, 10 Facer St., 3 houses.

F. C. Crawford, Ottawa St., $4,000 house at 37 Brock St.

J. H. McLaren, Port Dalhousie, Ont., $4,000 house on Facer St.

Sarnia, Ont.

Chambers Electric Co., $18,000 curling rink; $25,000 sunday school.

Sault Ste. Marie.

Taylor Bros., $9,000 store block on James St.; $9,000 mission.

O. C. Carney, 516 Queen St. E., $10,000 store block on Queen St.

J. H. Stearns, 350 Queen St. E., $4,000 house on Dennis St.

Toronto, Ont.

Bayview Electric Co., 65 Richmond West, $25,000

residence and garade north side Kilbarry Ave. near Warren Rd.

E. Addy, 128 Victor Ave., $15,000 house on Russell Hill Rd. near Frybrook Rd.

F. Phillips, 198 Gledhill Ave., $15,000 addition to garage rear 621 Yonge St.

Patterson Electric Co., 615 Yonge St., stables etc., $450, for city of Toronto.

Geo. Armstrong, 1319 Ossington Ave., 2 duplex residences, $30,000, corner Parkside Drive and Valley Crescent.

W. J. Crone, 27 Sparkhall Ave., 2 pair houses, $12,000, east side Elmer Ave. near Norway.

Elect Electric Co., 113 Victoria Park Ave., 3 pair houses, $6,000 each, north side Rhyl near Haslett Ave.; $7,000, 1657 Gerrard E.

T. B. Kilner, 601 Jones Ave., 1 pair houses $8,000 west side Brookside Drive near Burgess Ave.

I. C. Johnson, 1804 Danforth Ave., 5 houses, $3,000 each, west side Jane St. near Bexley Crescent.

Smart & Walsh, 130 Bingham Ave., $4,000 house east side Bingham near Bracken Ave.

Harris Electric Shop, St. Clair W., $10,000 garage and office, 365-7 Dupont St.

Taylor Bros., 25½ Norwood Rd., $5,000 house at 193 Bingham Ave.; $4,500 house west side Kingswood near Kingston Rd.

J. Ritchie, 718 Annette St., $12,000 duplex residence at 566 Durie St.; $8,500 residence and garage at 561 Durie St.

Nichol & Fagan, 111 Logan Ave., 2 pair houses, $7,500 pair west side Lawlor Ave. near Swanwick.

Wm. Gibson, 156 Beech Ave., 1 pair houses, $8,000 north side Riverdale near Pape.

L. Snow, 1217 College St., altering residence into duplex, at 248 St. Clarens Ave.

B. Balment, 77 Westlake Ave., 3 houses on south side Orley Ave. near Meagher Ave, $4,000 each.

P. J. Dunn, 3124 Dundas West, $12,000 duplex residence, north side Regal Rd. near Northcliffe; $10,000 duplex residence on Snowden Ave.; $7,500 house at 78 Glendonwynn Ave.; $12,000 duplex residence on Northcliffe Blvd.

Verdun, Que.

S. Quesnel, 309 Church Ave., $10,000 cottage on Lasalle Rd.

Prize Fool Question

"Something for you?"

That is heard every day and undoubtedly heads the list of foolish questions. Of course the customer wants something or why should he come into your store?

Close cousin to the above is the query, "What kin I do for you?" If the customers wish to reply in the same strain they would say, "You can't do nothing for I." Why not say, "Good morning, can I be of service to you?" or "What is your pleasure today?"

Trade Publications

The "World Number" of the O/B Bulletin is as pretty a little houseorgan issue as has come to hand for some time. It depicts the use of Ohio Brass Co. materials in many countries, and a lavish use of illustrations makes it very attractive.

A leaflet has been received from Wagner Electric Corporation, St. Louis Mo., describing the much talked-of Fynn-Weichsel motor. It is described as a radically new, constant-speed alternating current motor, operating as a slip-ring induction motor at synchronous speed.

The Dominion Insulator & Manufacturing Company, Limited, manufacturers of Ohio Brass products in Canada, are distributing a very complete catalog, No. 19 covering high tension insulators, trolley line materials, rail bonds and tools, third rail insulators and car equipment specialties. It is a special edition of the regular O-B catalog but it is understood that this Canadian company will prepare its own regular catalog in the near future. The catalog is thoroughly classified under the heads: porcelain insulators, pole hardware, trolley materials, catenary materials, bonds and tools, third rail insulators, and car equipment. A considerable portion at the end of the book is given over to valuable tables and data of various kinds. Complete catalog contains 770 pages.

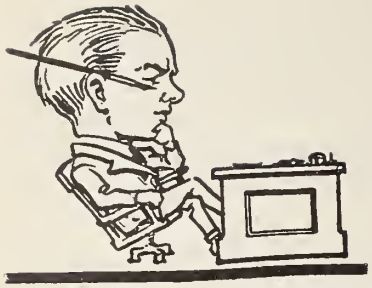
W. A. Gibson Ward Leonard Representative

The Ward Leoonard Electric Company of Mount Vernon, New York, announce the appointment of W. A. Gibson as selling representative. Mr. Gibson will make his headquarters in the Roos Building, Elm & Akard Streets, Dallas, and will handle the complete line of vitrohm resistor units, field rheostats, theatre dimmers, motor starters and ribohm rheostats in Dallas and vicinity.

Frank T. Groome in Regina

On Friday evening, October 19, Mr. Frank T. Groome addressed a gathering of Regina retail merchants under the auspices of the Regina Board of Trade on the subject "Building Store Profit with Light." The meeting was well attended and the information given was greatly appreciated by the merchants. Regina has a great many business men who desire good lighting but do not have sufficient knowledge on the subject to be able to decide upon their needs. The electrical trade intends to follow up this talk and secure the business that should result.

Mr. J. Jones has opened a new electrical store at 65 Pelham Street, St. Catharines, Ont.



The Editor Comments

Sidelight on House Wiring Prospects

An interesting sidelight on the house building situation, from which deductions as to probable house wiring business can be made, is included in a recent statement by MacLean Building Reports, Limited. This statement refers to the year' work, previous to October 31:

"The number of houses erected to date this year is 15,988, as compared with 18,083 for the same period in 1922, a drop of 11.6%. In view of the fact that the drop in cost is but 5.5%, and that material prices have remained approximately stationary, here is incontrovertible evidence that the building of workers' homes has fallen off, while that is the type most needed to relieve the housing shortage. The non-union worker cannot make the initial payment on a home costing $4,500 or over, and if he can, he is unable to carry the burden of interest, taxes and principal payments without sub-letting. This condition defeats the principle of home owning. If wages cannot be increased then the structural problem of erecting houses or flats which can be sold or rented at decidedly lower prices than those existing to-day cries out for solution."

The Superfluous Knocker

Destructive criticism, vulgarly called "knocking,," seems to be as abundant in the electrical industry as ice is at the North Pole. An experienced contractor was recently heard indulging himself in this practice to his heart's content. He "bawled out" first the manufacturers, then the jobbers, and then others in the trade, located in his own community. The last named came in for particular castigation because of alleged price cutting.

Without going into details, beyond stating the fact that this incident occurred in a growing place where there is lots of business, it is interesting to note that there is no association of electrical dealers and contractors in that city. Enquiries made in an endeavor to ascertain why there was not such an association, established the fact that one reason was that the prominent contractor mentioned above, had done his best by persistent destructive criticism, to break up an organization that had formerly existed. With a following of one or two satellites, he had opposed every move towards co-operation and had refused to take part in any of the activities of the association.

This then, was the man who complained of price-cutting, of sharp practices by other members of the trade. It would appear to be another case of poetic justice. He had refused to support an organization and now the disorganized state of the trade was hurting his business.

Coal and Industry

Events during the winter of 1922-23 showed that Canada—especially that part of it that depends on imported coal—had a vital fuel problem. As a matter of fact, the problem had always been with us but it had never been brought to the serious attention of the people until the strikes in the United States coal fields made a large part of Canada shiver all last winter.

The importance of a national policy as regards fuel is stressed in a recently issued brochure by G. R. Pratt, an engineer who has been active in laying before the people of central Canada the value of Western fuels. Mr. Pratt states that Canada is the one country which cannot develop without some fixed policy as to fuel. He emphasizes that Canada's present coal consumption is around thirty-two million tons. About 54 per cent of this is brought in from the United States at a cost to Canada of about one hundred million dollars. The consumption of coal per capita has doubled during the last 20 years. Decrease in available wood and increase in industrial development will probably result in the same increasing ratio of consumption per capita for some years to come. Consider Canada with twice the population 20 years hence. This would necessitate one hundred and twenty-eight millions of tons of coal per year.

Mr. Pratt endeavors to show that Canada's dependence on the United States for fuel is weakening her national development. "The condition to-day is," he concludes "that Canada requires certain coal for the upkeep of the country. Canada has coal sufficient for hundreds of years for any population which she might have, within reason or without reason. Unfortunately the coal is at the extreme ends of the country, east and west. The centre portion has become heavily populated and has no coal. One reason for this heavy population is due to industrial work which has grown up on account of its source of coal supply,

which has been and is now obtained from the adjacent coal fields of the United States. Is Canadian coal to be taken to this industrial centre or shall the industries move to the coal? What is required is a national policy on fuel that will be a profit to Canada."

Old Man Opportunity is Here

In this issue, space is again given to suggestions designed to help the merchant achieve a greater sales volume in the approaching Holiday Season. It seems unnecessary to point out that the biggest profits at this time of the year accrue to those who get after gift business. It takes effort, mental and physical, to plan the campaign, decorate and arrange the store, work out the window displays, create special advertising, and add new service features that customers look for during the Christmas Season, but if you aren't prepared to tackle the extra work, you needn't expect to reap the fruits of the harvest time.

Wonderful Northern Power Plant

We present in this issue an article describing the power development of the Abitibi Power and Paper Company, near Iroquois Falls, Ont. The whole project of this company is monumental, a testimony to Canadian skill and enterprise. In 1912, the site was dense forest, and since that date, the power development has been completed, the immense mill has been puilt, and the attractive town of Iroquois Falls has sprung up. The power plant is a vital part of the operations of the Abitibi company, which include the cutting of 200,000 cords of pulp-wood annually, and the daily production of 500 tons per day of newsprint in the gigantic mill. Our readers will recall that the late Mr. F. H. Anson was the founder and builder of this great business.

Notable Customer Ownership

Notable among the public utilities where employee and customer ownership is in practice, is the Commonwealth Edison Company of Chicago, which shows that nine out of ten of its 7,300 employees are stockholders; 35,000 of its customers are on its mailing lists when the dividends are divided. The Public Service Company of northern Illinois records 75 per cent of its 2,500 employees as shareholders and has 16,300 customer owners. The Central Illinois Public Service Company, which serves 198 cities and towns with electricity and gas, has 97 per cent ot its employees on its books as security holders and 10,184 customers own shares in the same company.—N.E.L.A. Bulletin.

When Engineers Testify in the Witness Box

Justice Riddell Tells Technical Men How to Give "Expert Evidence" in Court Proceedings

The growth of the system of giving evidence in court proceedings and especially the development of "expert" evidence were the basis of an exceptionally illuminating address delivered recently by Hon. Justice William Renwick Riddell to a joint gathering of the Toronto section of the Engineering Institute of Canada, American Society of Mechanical Engineers, Canadian Institute of Chemistry and the Society of Chemical Industry.

His Lordship spoke of expert evidence as the only opinionative testimony which was now proper in a court of law.

For a long time experts were employed in trials as sort of assistants to the judge, and their communicated knowledge was withheld from the jury. This, he said, was the old practice. But, though the development of the situation is somewhat obscure, it is certain, he stated, that by 1700 the present practice came into force whereby experts are allowed to give their "opinions." He described expert evidence as professional — acquired by scientific training, accumulated knowledge in the matter to which the particular evidence in question pertains. But to attain their privilege of opinion, expert witnesses must first establish qualification to be regarded by the court as proper experts, while, on the other hand, the lay witness is never first doubted.

In closing his address, interspersed with many humorous remarks, Justice Riddell gave to the gathering of engineers a code of approved conduct in the witness box. He held that it should be honest, that it should only be given by a person eminently qualified, and that it should be given in such a manner of clarity that it would impress its message of truth upon the minds of the jurors.

Red Seal Campaign Progressing

The Red Seal Campaign initiated by the Electric Service League of Toronto is already beginning to show evidences of accomplishment. A number of seals have been awarded, and a large number of applications for inspection have been made. In many cases the owners of houses under construction have promised to put in the Red Seal Standard.

At the November 14 meeting of the Toronto Electrical Contractor-dealers, there were several applications for the co-operative window dressing scheme of the League. The window in Mr. R. A. L. Gray's store, shown elsewhere in this issue, is typical of the displays being installed by the League.



Power house and dam at Twin Falls in spring flood, 1922. The dam is over 80 feet high. Two 40 foot Stoney sluices at right.

An Important Northern Power Plant

Development of Abitibi Power & Paper Company Represents the Last Word in Hydro-Electric Construction—Power House an Example of Good Architecture

By H. L. SANBORN*

The Abitibi Power & Paper Co., Ltd., with mills at Iroquois Falls, Ont., stands out as one of the splendid developments of the newsprint paper industry. To attain this success nature has been most helpful in supplying hydraulic power. Not in the unlimited sense; as is often quoted for the north country by the misinformed, but in sufficient quantities to insure adequate power to all, under proper co-operation and recognition of the various rights of the pioneer industries, and proper conservation.

The Abitibi River has its source in Abitibi Lake, a shallow body of water of 400 square miles area at normal high water of 878.50 sea level datum, the maximum or limiting head to which the Lake level may be raised.

The large area and comparatively shallow lake presented two hydraulic problems, one of reservoir capacity; and one of flood control, the reservoir capacity being limited by the depth of the lake and the cultivated easily flooded lowlands of the upper lake. The flood control was handicapped by the shallow outlet and the channel contraction at Couchiching Falls; which even with the old control dam entirely removed had insufficient cross-sectional area to care for flood conditions.

Therefore, in line with its progressive policy the Abitibi Co. finding by 1916 that adequate reservoir and flood control could not be attained at the Couchiching Dam, had a survey made at Twin Falls, twenty-two miles below Couchiching by river, to create additional storage and to provide ample flood water control for all emergencies.

Water Control

It was found that a proper control could only be attained at considerable expense, and the necessity for additional storage crystalized the plan to combine and utilize the storage and control works with an up-to-date power plant, allowing the economy of using the same storage twice and doubling the Iroquois Falls newsprint output to 500 tons daily at less than the original average cubic feet per second discharge for Iroquois Falls.

Some preliminary work was done at Twin Falls in 1916 but owing to the war conditions the actual work was started in March 1920. Contractors were Messrs. Morrow & Beatty Ltd., of Peterborough, Ont., under the supervision of W. B. Crombie, representing Geo. F. Hardy, consulting engineer of New Yorw City, and H. L. Sanborn, hydraulic and electrical engineer for the Abitibi Co.

The main dam is of the gravity type with a spillway 360 ft. long, 66.18 ft. wide at the base and 81.83 ft. high. The crest of the dam is specially designed to withstand the ice pressure. The elevation is 878.50 and raised the head water 57 ft. Core walls extend into the banks on either side of the river with the power-house on the west side.

The flood water control consists of two Stoney sluices 40 ft. clear openings with a sill elevation of 856.37. These are two trash sluices 10 ft. wide, elevation 860.00. In the base of the dam are three submerged sluices, 7 ft. by 7 ft. clear epenings, all three controlled by Coffin valves. The total discharge capacity of the dam at natural high water is 46,500 cubic ft. per second without use of the 360 ft. spillway.

These flood gates were tested during the unprecedented flood of the spring of 1922 and found adequate. A maximum of 27,800 cubic ft. per second was discharged as against a possible 14,000 second ft. through the old Couchiching control. This prevented a serious flood in the LaSarre section: and there still remained additional discharge capacity for even greater floods.

The power-house is of reinforced concrete. The roof trusses and crane beams are supported by heavy pilasters. The building is divided into two parts, the gate-house 162 ft. by 30 ft., and the generator room, 178 ft. by 40 ft.

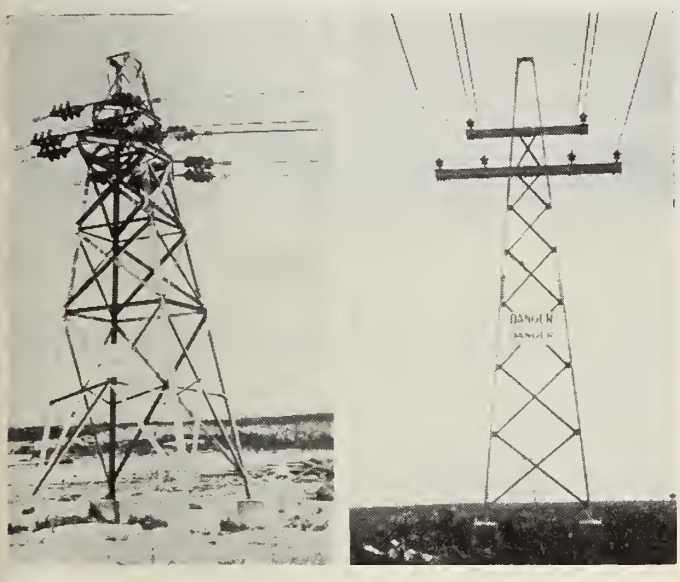
The exterior of the power-house is without doubt one of the most finished examples of power-house

*Hydraulic and electrical engineer, Abitibi Power & Paper Co.

architecture on the continent. The gate-house is provided with a 10 ton crane and the generator room with a 55 ton crane, both electrically operated.

The power-house equipment consists of four, single-runner turbines having a capacity of 6,000 h.p. at 128.5 r.p.m., on a vertical shaft with one blank unit for future use.

The water is taken in through a scroll case formed in the mass concrete, the runner being set within a distributor ring: all being being supplied and instal-



Strain and A frame towers on transmission line

led by the I. P. Morris Department of the William Cramp & Sons Co.

The governors are located on the main floor level and are type W., Lombard make. The operating cylinder and belted portion of the actuator are below the floor level. Water is used as the circulating medium, treated with bichromate of potassium as a rust resistor. Monel metal is also used in the construction of the valve rings and sleeves.

The generators and switching aparatus were supplied by the Canadian Westinghouse Co., Ltd., and consist of four 4500 kv.a. machines, generating power at 13200 volts, 60 cycles, 3 phase. Kingsbury thrust bearings are used and the lubrication is cared for by the Richardson Phoenix System. The generators are of the vertical type, with a 50 kv.a. exciter on the outboard end of the shaft.

Switching Control

The switching control is of standard Westinghouse construction consisting of ten panels for the control of the four 4500 kv.a. units; four 50 kv.a., 250 volt, d.c. exciters; one motor-generator exciter set; one bank of three 50 kv.a. station power transformers; three 10 kv.a. lighting transformers; two 500 volt feeder circuits, and two 3 phase, 13200 volt feeders to Iroquois Falls station. Panel No. 1 mounts a Westinghouse automatic voltage regulator, broad range type.

On a swinging bracket on the concrete column is mounted a type T-1 synchroscope and lamp, and two type T-5 voltmeters with 15,000 volt scale.

On the column at the end of the board is mounted one 3 phase, electrostatic ground detector and necessary condensers.

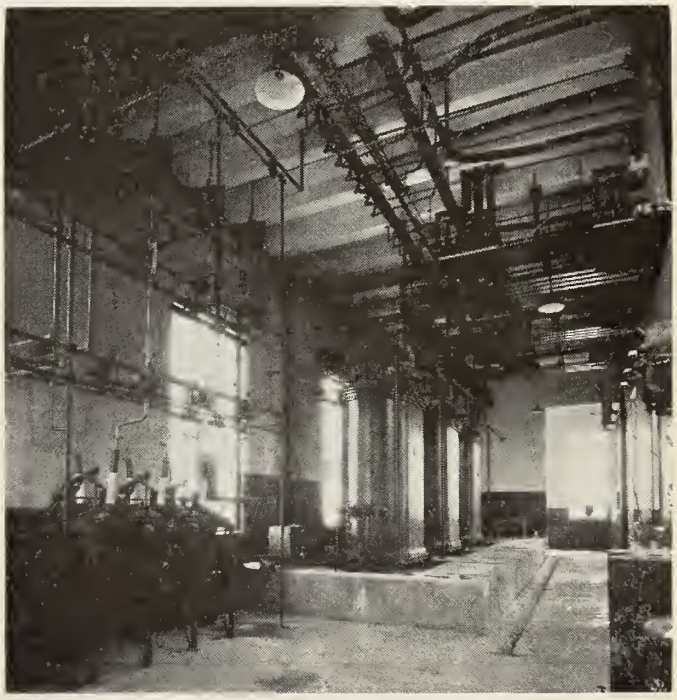
For all the 15000 volt circuits, Westinghouse type GA round tank, oil circuit breakers are provided, one set per each machine, one set for station service and two sets for the outgoing lines. All circuit breakers are remote-control, operated from the switchboard by a magnet switch or manually operated at the breaker. The breakers operate through a range of from 140 to 250 volts d.c.

Inasmuch as the generator neutrals are grounded, three series transformers per line are supplied instead of two so that the current may be read in any phase. The 13200 volt disconnecting switches are of Canadian Westinghouse type H., having auxiliary signal contacts. These switches are provided with a locking device to prevent opening under conditions of heavy short circuit. A bell alarm is provided which rings in case any of the 13,200 volt oil circuit breakers open automatically.

The generators and lines are protected by type CC and CR overload and reverse power relays. These include three transformers and three relays per circuit as the generator neutrals are grounded. The type CR relays will operate on approximately 10% reverse current. The relay will operate for reverse current even although the voltage of the circuit may drop of 2% of normal.

The generator main leads are No. 0000 stranded, cambric-insulated, lead covered cable, insulated for 20,000 volts.

Connections are made from the oil switches to a single 13,200 volt bus, which passes through to the high tension chamber. At this point two outgoing lines are tapped off the main bus having disconnecting switches and type GA oil circuit breakers. The

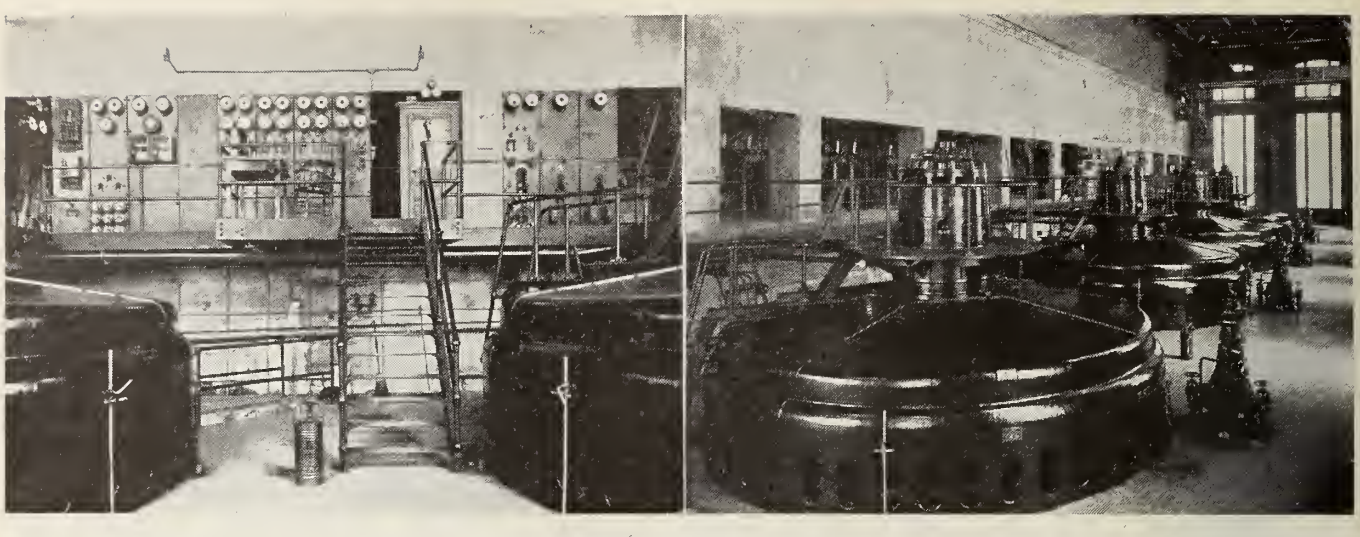


Sub-station at the mill, Iroquois Falls, Ont.

bus and leads to the two outgoing lines consist of hard drawn copper tubing of sufficient capacity to carry the full load of the station on each line. The two outgoing lines are protected by choke coils and electrolytic lighting arresters.

Transmission Lines

The transmission line is stranded copper cable of 300,000 c.m. Two circuits are strung on steel A



Left, switchboard control of the four 4500 kv.a. Canadian Westinghouse generators; right, general view showing the four units direct connected to Morris turbines

frame towers set 400 ft. apart with a substantial heavy anchor tower one in eight.

Canadian Porcelain Co. insulators are used on the A frames and Hewlett insulators in strings of three on the anchor towers with suitable strain clamps. The lines were strung by dynamometer at a pull of 7000 lbs. at a temperature of 20 deg. below zero. The length of the transmission line is 4½ miles, from power-house to sub-stations.

Tower No. 2 outside the sub-stations at Iroquois Falls is a switching tower mounting Westinghouse pole top air break switches automatically controlled from the two sub-stations, allowing the paralleling of the two lines and sub-stations, or the segregation of a line to each sub-station.

Sub-stations

The sub-stations are of the indoor type. Sub-station No. 1 comprises three 1750 kv.a. and three 1000 kv.a. Canadian General Electric power transformers, all of which are 60 cycles, single phase, water-cooled, shell type, of voltage 12000/600 with 2½% taps above and below normal.

Sub-station No. 2 contains three 5000 kv.a. step-down transformer units, similar in voltage to the units in sub-station No. 1.

The incoming lines in both sub-sections are protected by choke coils and electrolytic lighting arresters and are supplied with type H disconnecting switches and type GA oil circuit breakers and CR reverse current relays. The high tension side of the power transformer connections consists of hard drawn copper tubing mounted on 15,000 volt pillar type insulators.

The 600 volt connections consist of hard drawn copper strap, beginning at the low tension side of the power transformer, and extending to the switchboard side of the feeder oil switches. The bus-bars are provided above or adjacent to the transformers and 4 sets of three phase strap copper risers are connected thereto. The bus-bars at the switchboard are divided into two sets. All these divisions of the buses are made in order to reduce the heating of the copper bus bars due to mutual inductance between phases.

The sub-station of No. 1 switchboard is on a galley in the grinder synchronous-motor room and consists of 14 control panels for the transmission lines and meters, together with the control for five 1250 kv.a. synchronous motors direct-connected to pulp grinder.

Sub-station No. 2 is for the distribution of power to the paper mill proper, and consists of a fine concrete building two stories high having on the first floor the incoming lines and transformers and the secondary 600 volt bus. This latter is interleaved to reduce the heating and is clamped securely to suitable 600 volt bus-bar supports so there will be no danger of distortion of the bus-bars in case of short circuit. Risers extend upward to the second floor where four special switching compartments have been provided, each mounting eight Canadian Westinghouse type B 600 amp., oil circuit breakers. Thus any trouble with any particular switch is limited to a certain section of the feeder equipment and will not effect the switchboard as a whole. Each circuit breaker is mounted remote control. The switchboard proper is directly outside these compartments and consists of one lighting panel, eighteen feeder panels controlling 32 mill feeders, and two transmission control panels with the usual meter equipment and Type CC overload relays.

Mill Feeders

The feeders to the mill consist of 600,000 c.m. cable and pass out through suitable wall insulators to a tower on the mill roof and thence directly to the distribution boxes. All feeders throughout the mill are in conduit except the sulphite mill which is lead covered.

W. J. Herdman With Canadian Independent

W. J. Herdman, Canadian Independent Telephone Company, has been appointed to an entirely new position in that organization. He is in charge of the consolidated research and patent development work. Among the engineers on his staff, is Mr. E. S. Rogers, radio engineer, who is doing the work formerly handled by Dr. Culver. Mr. Herdman is a graduate of Cornell University in electrical and mechanical engineering, and has had wide experience on the line of work on which he is now engaged.

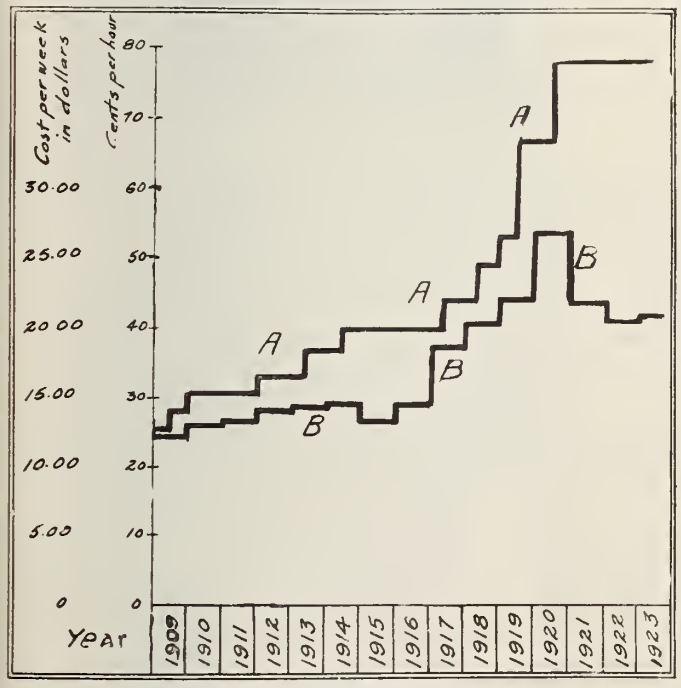
The Kenwood Electric Company has been registered at 9 Burnfield Street, Toronto.

Are Hydro Workers Reasonable in Wage Demands?

Hearing Before Snyder Board Draws Attention to Fact that Wage Scale Remains at 1920 Height

Evidence was taken during the third week in November on a matter at issue between the Toronto Electric Commissioners and a Board appointed some time ago by the Department of Labor at Ottawa, generally known as the Snyder Board, which is of special interest to every public utility in Canada. This hearing, which was before Mr. Justice Mowat, followed an interim injunction recently issued by Mr. Justice Orde restraining the Snyder Board from exercising compulsory power, in taking evidence, provided for in the Industry Disputes Investigation Act of 1907, commonly called the Lemieux Act.

The conditions leading up to the present hearing may be summarized briefly as follows: When the question of an increase in wages was raised some time ago by the employees of the Toronto Hydro-electric System, the men were unable to justify their claim to the satisfaction of the Toronto Electric Commissioners. Thereupon the men applied for a conciliation board under the Lemieux Act, and named their representative. The Toronto Electric Commissioners refused to be a party to the appointment of this Board taking the stand that the Lemieux Act did not apply in their case. However, the minister of labor, under powers given him by the Act, named



AAA—Linemen's wages, cents per hour
BBB—Labor Gazette family budget, dollars per week

a representative to act for the Toronto Electric Commissioners and he, with the representative of labor, agreed upon Judge Snyder as third member and chairman.

At this point the Toronto Electric Commissioners applied for an injunction to restrain the Snyder Board from taking evidence under the Act. An interim injunction was allowed by Mr. Justice Orde as already stated above, and it is interesting to note that he based his decision on the argument that the Lemieux Act was ultra vires of the Dominion Government, that is, the settling of disputes between a local public utility and their local employees was not a matter for Dominion legislation, as outlined in the British North American Act.

The evidence that has just been taken was largely in connection with this point. The Toronto Electric Commissioners based their right to disregard the Lemieux Act on the argument that this Act is ultra vires of the Dominion Government. They also claim in addition that as a creation of the provincial government they are responsible to that government only. In these contentions they are supported by representatives of the provincial government.

The Snyder Commission was supported by the Department of Labor at Ottawa and their evidence endeavored to show that the inconveniencing effects of a dispute between the Toronto Electric Commissioners and its men might reach to other provinces or even to the United States and hence the question was one of Dominion status.

The matter is being argued on November 29 and from all appearances, which ever way the judge decides, it will go on to the Privy Council.

Aside from the very convincing evidence regarding the ultra vires phase of the Act and the localized provincial nature of the question, one cannot but wonder upon what evidence the employees of the Toronto Hydro System base their claim for increased wages or indeed for a continuation of the present wage. It seems quite clear that wages have increased out of all proportions to the family budget. Take the case outlined in the accompanying curves, for example. In 1909, linemen's wages were 25c. per hour. In 1920 these had been increased to 78c. per hour, an advance of 212 per cent. For the same period the family budget, according to the Labor Gazette, increased from $12.79 per week to $26.92 per week at the highest point, that is, July 1920—an increase of only 110 per cent. However, we note that this $27.00 of three years ago has fallen to $20.72 so that the weekly family budget today shows only an increase from $12.79 to $20.72,—62 per cent. This is all brought out clearly in the curves. Notice how closely they lie together in 1909; then they gradually diverge up to the end of 1916, to the advantage of the wage earner. During 1917, 1918 and the early part of 1919, they again rise fairly uniformly but in the latter year labor takes a leap ahead and there is a wide unbridged space between the linemen's wages and the weekly budget. Since July 1919, in spite of the fact that the weekly budget has been reduced from $27.00 to $20.72 the wage line remains constant at 78.

Equipment for Hemming's Falls Development

Orders from the Canadian General Electric Company by Southern Canada Power Company are as follows: Two 6,000 kv.a., 3 phase, 30 cycle, 2200 volt, 150 r.p.m., vertical type, generators; four 6,000 kv.a., 3 phase, 60 cycle, 6600 volt, 150 r.p.m., vertical type, generators; twelve 2,000 kv.a., single phase, 60 cycle, 6600/48,000 volt water cooled transformers. From the Dominion Engineering Company: Six 150 r.p.m. turbines, vertical type, capable of developing 6300 h.p. at 55 foot head. The generators are rated at 6,000 kv.a., which is 4800 k.w. at 80% power factor.

Presentation to John W. Pilcher

Just before the departure of Mr. John W. Pilcher to take up his duties at the head office of his company in Toronto, his friends in Montreal—that is "the electrical industry"—tendered him a farewell luncheon and presented him with a handsome fitted travelling bag and a gold fountain pen. J. W. was a pillar of the industry in Montreal before some of us had discarded short trousers and some real heart to heart things were said on that occasion by his friends, that made him almost regret his promotion. The chair was accupied by Mr. K. B. Thornton and other speakers included Fred Thomson, C. S. Bagg, E. W. Sayer,M.P.P., W. B. Shaw and George C. Rough.

The presentation was accompanied by a brief address as follows:

"Your friends desire to express their deep regret at your departure from the field in which the best part of your life has been spent, and where you have always been held in such high esteem.

"The Electrical Fraternity, as a whole, will greatly miss a staunch and loyal friend, a worthy foe, a relentless competitor.

"Whatever your new duties may be, we know they will be discharged in the same indefatigable manner that has characterized your activities amongst us.

"We ask your acceptance of this gift, accompanied by our heartiest good will, and best wishes for your health, wealth and prosperity in the future."

(Signed) C. H. Abbott, A. Allan, C. S. Bagg, R. H. Balfour, Leon Beauchamp, De Gaspe Beaubien, D. E. Blair, Fred B. Brown, John A. Burns, C. B. Coulson, Ernest Craig, S. Cunha, Jos. A. Dawson, Cecil F. Doutre, Albert Dupuis, H. L. Etienne, Walter J. Francis, Lawford Grant, Dr. L. A. Herdt, R. J. Hiller, Henry B. Irving, Lee H. Jones, J. D. Lachapelle, W. J. Lynch, Hugh Lyons, P. A. McFarlane, H. Mallison, R. Moncel, D. W. Massie, T. J. Mullen, J. S. Norris, V. J. O'Donnell, F. J. Parsons, Geo. C. Rough, James Ross, E. W. Sayer, M.P.P., J. A. Shaw, W. B. Shaw, S. W. Smith, Julian C. Smith, Irving H. Smith, E. Tanguay, G. E. Templeman, K. B. Thornton, Fred Thomson, Clarence Thomson, E. J. Turley, John J. Warren, H. W. Weller, R. M. Wilson, W. H. Winter, J. B. Woodyatt, John J. York.

Joint Meeting A.I.E.E. With Other Societies

On November 1, the Toronto Section of the A.I. E.E., held a joint meeting with the Toronto Branch of the Engineering Institute of Canada, Toronto Section Amercian Society of Mechanical Engineers, Toronto Branch Canadian Institute of Chemistry and the Society of Chemical Industry.

The different societies gave some announcements as to their coming meetings after which Mr. C. R. Young, Chairman of the Toronto Branch E. I. C. introduced the speaker of the evening Honorable Mr. Justrice Riddell, who gave an interesting and instructive address, taking as his subject, "Expert Evidence."

B.C.E.R. Co. Issue Descriptive Booklet

The British Columbia Electric Railway Company, Ltd., have issued a very attractive booklet with beautiful illustrations describing the various operations of this company in and around Vancouver on the mainland and on Vancouver Island. The various plants as operating at present are illustrated and described, total output of the company is given, the expenditures that have been made from time to time and the future plans for further power development are outlined. The B.C.E.R. Co. controls the entire electric situation in the district which it covers, that is, it supplies transportation, power and light. It also operates the gas plant. One get an idea of the magnitude of the transportation system in the fact that the rolling stock now consists of 925 cars which includes 18 electric locomotives. This system annually carries in the neighborhood of seventy million people. At the present time they have under construction an electric pumping plant for the Sumas Land Reclamation Scheme. They are also adding to their hydro electric generating capacity at Stave Lake.

W. S. Ewens Goes to Sangamo

Mr. W. S. Ewens has resigned from the Northern Electric Company to take charge of the Ontario District Sales Organization of the Sangamo Electric Company of Canada, Limited, and the Wagner Electric Manufacturing Company of Canada, Ltd., succeeding Mr. R. M. Scrivener who has been appointed special agent for the Wagner Electric Corporation, of St. Louis, and is at present on a trip in the Orient.



W. S. Ewens

Mr. Ewens graduated from McGill University in 1907 in electrical engineering, and has had a wide experience with both the Canadian Westinghouse Company and the Northern Electric Company. For a number of years he has had charge of the apparatus sales department of the Northern Electric Company's Toronto district and is well and very favorably known throughout the province.

Transmission Lines Quinze River Power By Northern Aluminum Co.

The contract for the transmission wires for the power lines of the Northern Canada Power Company for their Des Quinze River plant is being supplied by the Northern Aluminum Company. The towers are being supplied by the Canadian Bridge Company. The cables are 3/0 aluminum, six strand with steel core; all seven strands are the same size with a diameter of .1670 inches. This cable has an elastic limit of 4690 lbs, an ultimate strength of 6,660 lbs, and weighs 1,227 lbs. to the mile. There are two circuits of three cables each. This means a total length of 720 miles of single cable. The span is 800 ft.

The Northern Aluminum Company and the Canadian Bridge Company also have the contracts for the Hollinger development power line. Specifications for the cable are the same as above.

New Radio Apparatus on Pacific Coast

Continuous Wave System Replaces Spark Method in Installations By Department of Marine and Fisheries

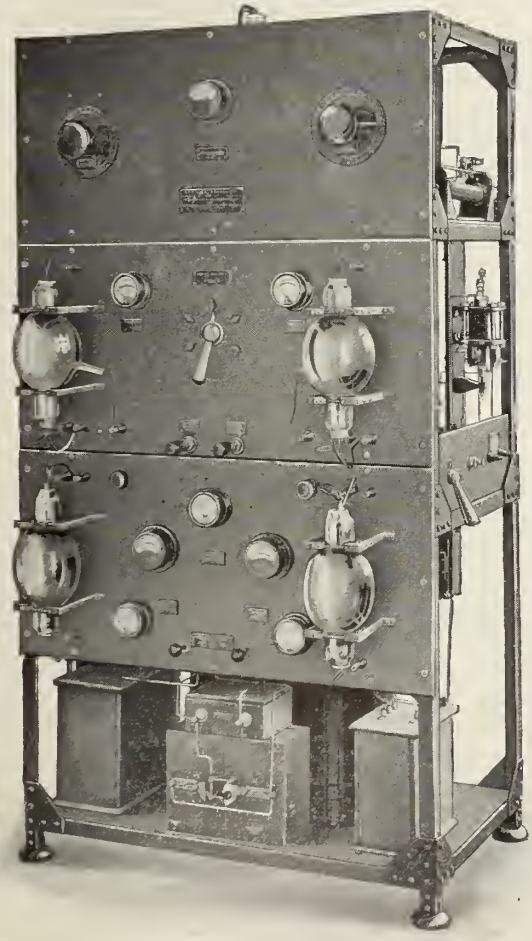
In keeping with progress in the radio art, the Department of Marine and Fisheries is installing continuous wave equipment of the latest design at four of its commercial radio stations on the Pacific Coast.

This chain of stations was first established by the Department in 1907 for the purpose of affording aid to navigation. The facilities offered by these stations for the rapid transmission of business between points on land, in addition to communication with ships, later became evident and the eight stations comprising the chain are now divided into two general groups; (1) those handling ship-to-shore traffic and (2) those handling point-to-point traffic and communicating with private commercial stations at logging camps and canneries located in isolated places as well as dealing with local ship traffic.

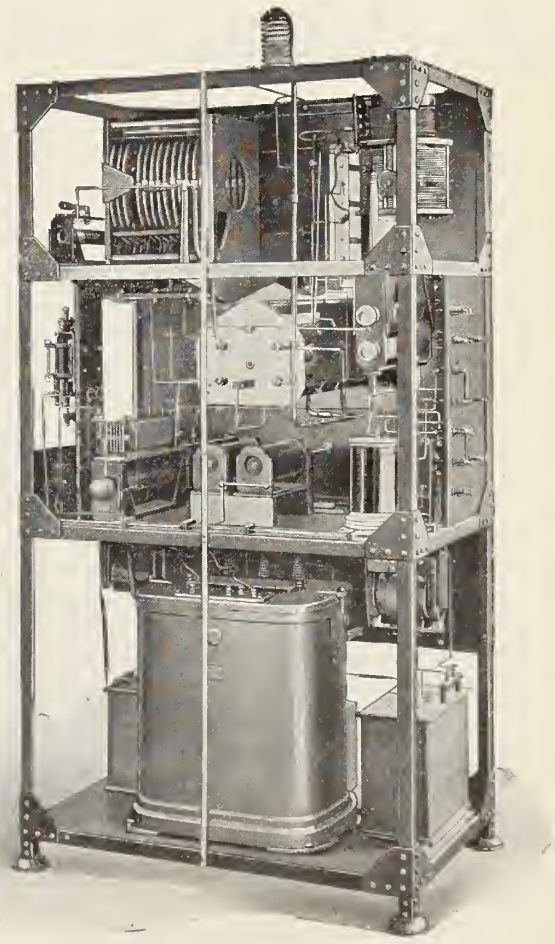
One of the new continuous wave transmitters will be installed at Esteven Point for long range communication with ship stations similarly equipped. The other three sets will be installed at Point Grey, Alert Bay and Digby Island respectively, and will replace the spark system in the transmission of point-to-point traffic. These sets are also designed for radiotelephone transmission and suitably equipped private and commercial stations along the B. C. Coast will in the future, be able to exchange messages by voice.

The installation of these c.w. transmitters will not only improve communication, but will reduce the interference now resulting from the use of spark apparatus. The time has not yet arrived when "spark" equipment may be entirely dispensed with in ship to shore communication, but the installation of continuous wave apparatus at the Department's Coast Stations is a step in anticipation. Much interest has been displayed in commercial and advanced amateur radio circles concerning the nature of this new equipment which has been designed and manufactured by The Marconi Wireless Telegraph Co. of Canada, Limited, and for the benefit of the readers of Electrical News we are giving the following abridged technical description.

The transmitting apparatus is of the standard Marconi 4 kv.a. type though specially designed to operate off a 110 volt, 350 cycle power supply. It is a self contained unit, the complete apparatus being mounted inside a substantial angle iron frame, 3 feet deep, 3 feet 9 inches wide, 7 fet high and is built to



Front view of Marconi Transmitting Apparatus



Back view of Marconi transmitting apparatus

operate over a wide range of wave-lengths. The component parts are mounted on two heavy shelves and three formica panels.

At the back of the top panel are mounted the necessary h.f. inductances and condensers, and on the front, a radiation ammeter. Through this panel project the long and short wave reaction controls. On the front of the middle of the panel are mounted two MT-6 valves, a plate feed ammeter, and a filament voltmeter. The control handle of the wave-change switch is mounted in the centre of this panel. By means of it, any one of five wave-lengths may be instantly selected, one operation making all the necessary adjustments of inductance, anodes tap, etc. Below this are the filament adjustment and filament compensating chokes, both of which may be quickly adjusted by means of controls projecting in front to maintain the correct filament current, whether the set is being keyed or not. On the bottom panel are mounted two MR-6 rectifier valves, together with two filament rheostats and a filament ammeter. Two d.c. milliammeters are provided to facilitate the maintenance of a good balance between the two legs of the rectifier. A voltmeter and ammeter register the power supply. At the bottom of the rectifier panel are two switch handles, one of which short circuits and thus discharges the smoothing condenser; the other changes over from straight c.w. to i.c.w.

Two complete inductance units are provided; one covers wave-lengths 600 to 800 meters, and the other 2,000 to 3,000 meters. The short wave aerial tuning inductance is of copper strip wound on a formica frame. Immediately above it is the anode coil inside of which rotates the grid coil. The long wave inductance unit is built up of a series of single pancake coils of litz wire assembled in a compact formica frame.

When used as a 4 kv.a. continuous wave transmitter, two standard Marconi MT-6 valves are used as oscillators. A switching arrangement is provided for adapting one MT-6 as a modulator for speech transmission. A second switching arrangement adjusts the grid leak of the oscillating valve, connects the modulator grid to the speech amplifier, throws the speech amplifier into circuit, and lights the amplifier valve filament. The valves are lighted through two step-down transformers. The high tension d.c. supply is obtained through a step-up transformer and two Marconi MR-6 rectifier valves, the double wave being smoothed out by a suitable filter. An adjustable power choke is provided to permit of proper regulation of the transformer input. The transformer is controlled by a magnetically operated keying relay operating off a storage battery. This relay controls the primary input to the power supply transformers, the grid circuit of the oscillator valves, and the filament compensating choke which maintains a constant filament current while the key is being operated.

The "Send-Receive" switch is also of the remote control magnetically operated type and it breaks the power supply at the same time as it switches the aerial to "Receive." A suitable frame and screen protects the operators from high tension parts of the apparatus.

Development of Electric Rail Traction-I

In the Last 40 Years Our Modern Systems Have Arisen— How the Motor Evolved

By N. W. STORER*

It is now some 40 years since electric traction was first considered a commercial possibility. A few small electric light stations using 110 and 220 volts, a few small shunt motors, and the constant current arc systems of Brush and the Thompson Houston Co. were all that the pioneers had with which to start the development of the electric railway. After all, the essentials were there—a machine to generate electricity and a motor to take the electricity and develop mechanical power. All the problem then consisted of was to provide a pair of conductors between generator and motor and connect the armature shaft of the motor to the car or locomotive axle. But there is a vast difference between a car having a motor with copper brushes sitting on the platform, belted to the axle, that would move occasionally when conditions were satisfactory, and the street car of today that runs as reliably as a watch in good weather and bad. If any one had actually foreseen the difficulties and problems that would have to be overcome and solved, it is doubtful if he would have had the courage to go ahead. Fortunately the vision was limited, and the difficulties and problems usually came in series. And they were solved one by one.

Of course a great many problems were susceptible of several solutions—all equally good or at least good enough to satisfy the users—but some of the problems were solved in one way superior to all the others. Such solutions form high spots on the even curve of development, and it is well worth while to consider some of them and show how essential they have been to the art.

Series Motor Adopted

Of course the motor itself is of primary importance. It was soon found that the shunt motor was not well adapted to railway work. The great variation in line voltage had a very bad effect on the motor torque, and where two motors were used it was difficult to divide the load on account of variations in the field. So the series motor with its heavy starting torque together with its variable speed characteristic was soon adopted and has been the universal standard practically ever since. This may be called high spot number one.

Of equal importance was the invention of the carbon brush. Present day students of engineering can hardly appreciate what this has meant to the industry. It is scarcely too much to say that if we had had to continue to use the copper or other brushes that were in use at that time electric traction would have been tremendously retarded if not made impracticable. The copper brushes under the severe conditions imposed cut the commutators badly, required

*Westinghouse Elec. & Mfg. Co.

constant attention, frequent expensive renewals, and complicated reversing mechanism. The carbon brush, by its high resistance contact, improves commutation and prevents cutting the commutator surface. The brushes themselves are relatively cheap, and being placed in radial position on the commutator are independent of direction of rotation. The carbon brush was a life saver for the railway motor.

Connection to Car Axle

The connection between the motor armature shaft and the car axle was then as it is now a very serious problem. It would take a book to describe all the more or less complicated and unsatisfactory methods of transmission that were tried out. It was not until Sprague took the bull by the horns and mounted one side of the motor on the car axle and connected the armature to it through two sets of gears, forming what was known as the double reduction motor, that a satisfactory solution was reached. This system met with immediate favor, and practically every successful street railway motor since then has had one side mounted on the car axle. Its greatest disadvantage is in adding to the dead weight on the axle, and in subjecting the motor to severe vibrations and exposing it to all the dirt and moisture from the street. In any case, it is the best scheme that has been devised, and has persisted for 37 years.

The double reduction gear motor lasted about 5 years and was then superseded by motors with a single set of gears. The one designed by Lamme and known as the Westinghouse No. 3, was quite revolutionary in character, and inasmuch as it set the type for succeeding generations of motors, it deserves special mention.

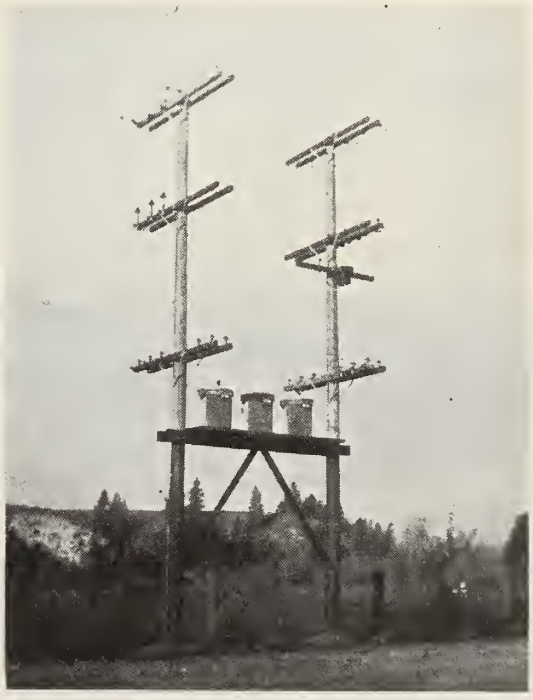
Practically all previous motors has had only two poles. This had four poles projecting inwards radially from a circular magnetic ring. Other motors had had hand-wound smooth core armatures. The No. 3 had a slotted drum armature with form wound coils. Other multipolar machines had had armature windings with as many parallel paths as there were poles in the machine. The No. 3 motor had only two parallel circuits, and therefore needed only to brush-holders 90 degrees apart. All of the previous motors being of the two-pole type, had windings and commutators very much exposed to the dirt and mud of the streets and suffered very severely on that account. The No. 3 motor with its circular frame offered a natural protection to the windings and in addition was completely enclosed on the lower half of the frame. The No. 3, like its Westinghouse double reduction predecessor, also had the gears completely enclosed and ran in grease. This decreased the noise and increased the life of gears and the motor efficiency. Other minor features combined to make this motor a most noteworthy advance in motor design. Within a period of two years practically every street railway motor built embodied most of these features.

In the next 10 years there followed many refinements in design. Motors were made with cast steel frames with laminated steel poles bolted in place, field windings had heat-proof insulation added on the inside of coils, armature windings were perfected, brushholders and commutators vastly improved, and changed from grease to oil lubrication.

Then came a change which marked another high spot—the introduction of the commutating pole. In a reversible motor operating as the railway motor has to do, the brushes must necessarily be fixed in one position—the no-load neutral point on the commutator. Obviously, it was not in the best position for commutation for either direction of rotation, and consequently there was always more or less sparking and wear of brushes and commutators at all times, as well as a tendency to flash-over; all of these things had practically limited the operating voltage to about 600. The commutating pole is a small auxiliary pole located between the main poles of a motor with a coil in series with the armature. It is made o such strength as to overcome the armature reaction, and in addition generates just enough voltage in the coil under the brush to balance the reactance of the coil and thus give sparkless commutation. The introduction of commutating poles has practically eliminated the question of commutation and has thereby made it possible to greatly increase the permissible voltage on the motor. 600 volts is still the standard voltage for street cars, and practically all motors operating cars are designed for not more than 750 volts. In many cases, however, they are connected two in series and operate at a line voltage of 1,200 to 1,500. Other large locomotive motors have been designed for 1,500 volts and operated two in series on 3,000 volt circuits. This was never considered safe prior to the advent of the commutating pole.

Western Outdoor Sub-station

The accompanying illustration is taken from a photo sent the Electrical News by Mr. S. H. Excell, city superintendent of Vernon, B. C. It shows the appearance of the new Vernon-Coldstream step-up station, recently completed, which has a capacity of 75 kv.a., stepping 2200 volt, 60 cycle, current up to 4400 volts. The transformers used were three 25



A photo by Mr. Excell

kv.a. by the Moloney Electric Co. and temperature indicators were by the Packard Electric Co. The Canadian General Electric Co. supplied lightning arresters, oil circuit breaker, insulators and line material.

Modern Business Lighting Demonstration In Winnipeg

The active spirit in the Electrical Industry in Winnipeg, so much in evidence this year, sought outlet in a real up-to-date Modern Business Lighting Demonstration. The Manitoba Electrical Association and Winnipeg Electrical Contractor-dealers' Association inspired by the success of Winipeg's Electric Home, have been convinced of the value of centralized effort to educate the public. As a part of the main scheme to focus attention on the idea of what proper and adequate lighting can do, the following evening lectures and demonstrations were arranged and given by Mr. Frank T. Groome:

Monday, Oct. 22nd. Subject:—"Light Control and Illumination," given to architects, engineers, builders and manufacturers; an attendance of 70 persons was registered.

Tuesday, Oct. 23rd. Subject:—"Turning your Lighting Dollars into Selling Ability," given to retail merchants, automobile dealers, window trimmers, realtors; at this meeting an attendance of 130 persons was shown.

In addition to these lectures a very well attended lecture on the subject of "Better Lighting" was given to members of both associations by Mr. Kenneth McIntyre of the Society of Electrical Development.

A very important phase of these activities was a class of instruction held for all Winnipeg salesmen in the industry, conducted by Mr. Groome, with the assistance of Mr. McIntyre, full advantage being taken of this opportunity to instruct the selling forces of the different Winnipeg organizations.

At the regular luncheon meeting of the joint Associations held in the Fort Garry Hotel on Thursday, Oct. 25th, Mr. McIntyre directed thought to the divisions of co-operative effort from the national local and individual angles, explaining the methods needed to overcome sales resistance in the industry through these channels. In the final analysis by the speaker, these co-operation principles outlined, were tied on with the present campaign in Winnipeg with good effect.

A "get-together" meeting of wide scope was staged in the Fort Garry Hotel, Winnipeg, on Thursday, November 15. The meeting was held as one of the regular luncheons of the Manitoba Electric Association and the Winnipeg Electrical Contractors-Dealers Association, and was the setting for the final launching of a "Modern Business Lighting Campaign." In the words of the organizers, the trade didn't wait to be carried along by the Big Wave—they were an actual part of the wave. There was a bumper attendance and much enthusiasm. It will be noted from another item in this issue just how the way has been paved for this effort. At the luncheon, Mr. J. H. Curle, secretary Winnipeg Division of the Retail Merchants Association of Canada, addressed the meeting on the subject "Undivided Effort—Where it begins and where it ends." A short address was also given by Mr. K. A. McIntyre and by various officers of the association.

Tipless Lamps, 5—5,000 Watts

One of the interesting features and one that created considerable interest at the recent Windsor Electrical Show, was the exhibit of the Dalyte Electric Limited, Guelph, Ont. Their display consisted of electric heating appliances, flexible conduit and their new "holo-stem" tipless lamps which were displayed in sizes from 5 watts up to and including the 5,000 watt lamp. Mr. Wheeler, general manager of the company, says this is the first exhibit ever made of tipless lamps in the full range of wattages in this country, the United States, or Europe. The method of manufacture is new and novel and we understand is fully protected by Wheeler patents pending.



A recent week-end on Harry Nicholls' Happy Hunting Ground. Left to right:—the host himself; S. V. Trimble, Ontario Hydro; Bert Cooper, Ferranti; Tom Gass, Canada Wire. The gentleman with the Napoleonic pose is Ed. Brandon, chief elec. engineer, Ontario Hydro. George Leacock, Moloney Electric, occupies, as usual, a modest position in the background.



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Co-operative Sales and Service Plan Speeds Up Electric Truck Business

One of the best bits of evidence that electric truck business is on the brink of a period of unprecedented expansion is the co-operative sales and service plan which has been put into effect by the Electric Transportation Co., Inc. of Hartford, Conn. This company, which until very recently was a department in the Hartford Electric Light Company, has branched out as a separate business under the direction of W. M. Thayer, fully convinced that it will not be long before the electric truck will replace the horse-drawn vehicle and the gasoline truck for at least 80 per cent. of all city delivery work.

The Electric Transportation Company have arranged that the purchaser of an electric truck does not need to buy a storage battery but may rent one from the company. In this connection the service organization supplies a battery for each vehicle and not only services it but the user pays a mileage basis with discounts from the fixed rate where the driver uses common sense in operation.

The battery rental service relieves the owner of the investment in a battery and also of repairs and charging. Continuous day and night service is rendered so that the exchange of a discharged for a fully charged unit is possible at all times. This arrangement permits of continuous operation if desired by the user as is often the case in busy seasons when there is both day and night work to be done.

That the service and storage plan is appreciated by the users of electric trucks in Hartford and vicinity is shown by the fact that 89 per cent. of them are serviced at the station. In addition, many of the owners of other makes take advantage of the battery plan.

Book Review

"Standard Lighting," published by H. C. Cushing, Jr., is a complete collection of information on lighting with incandescent lamps. In its preparation, the aim was to present information of practical value to the purchaser and installer of lighting equipment. The contents includes material on illumination fundamentals, design data, several chapters on lighting for various types of buildings, maintenance of interior lighting systems, street lighting practice, code of lighting, etc. There are 272 pages, with 240 illustrations. The price is $3.00 post paid.

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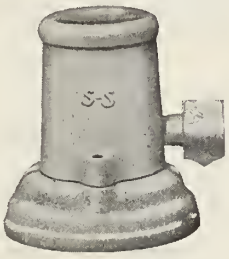
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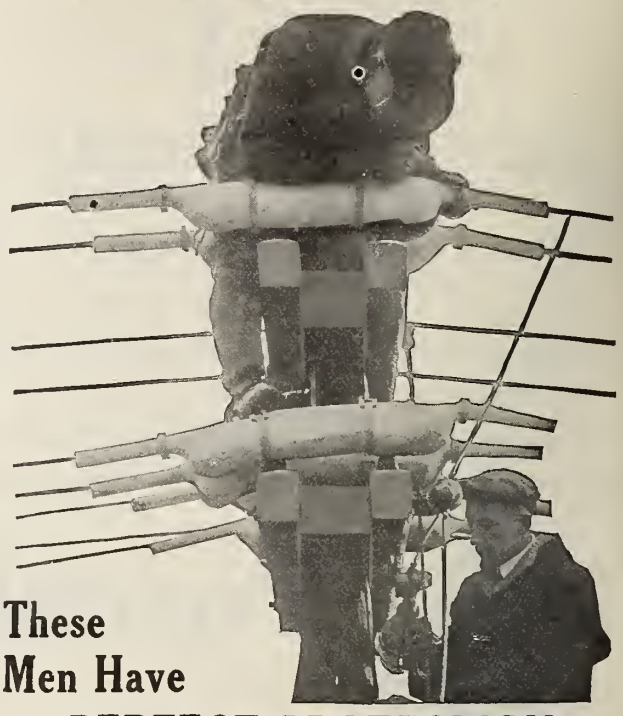
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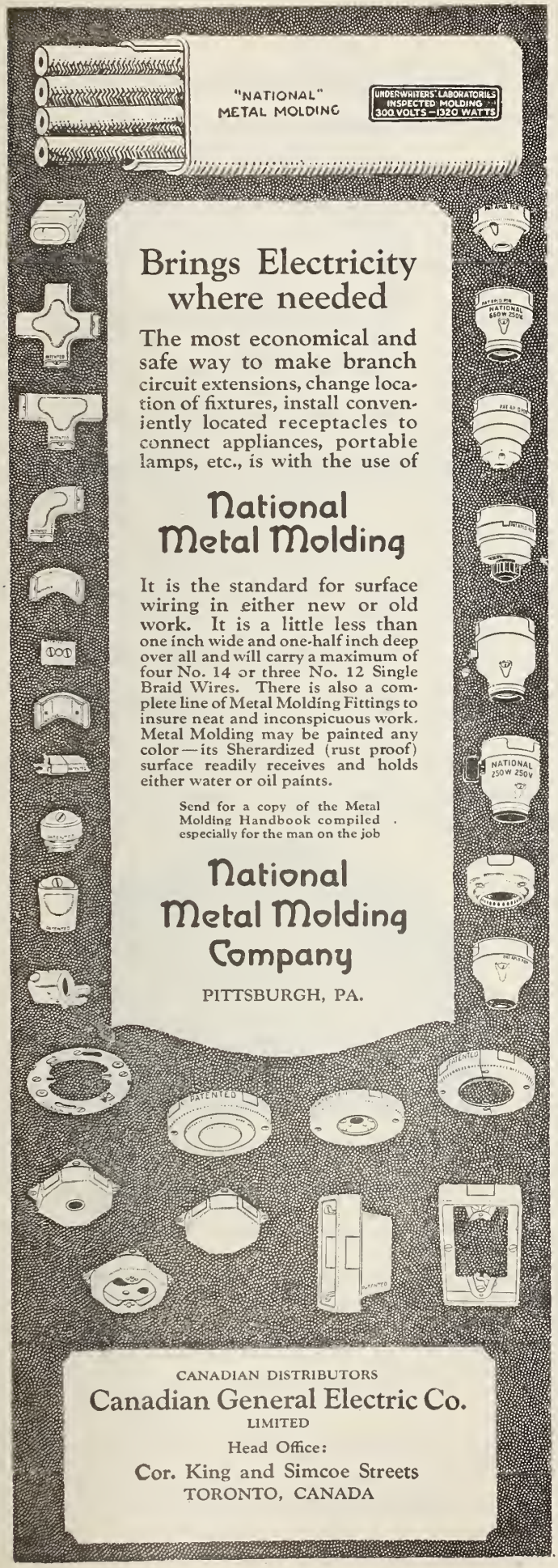
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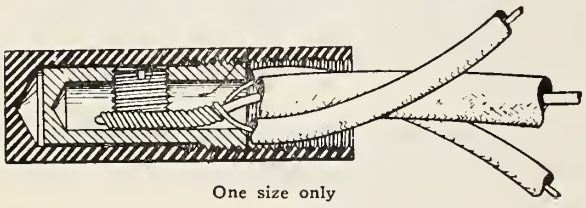
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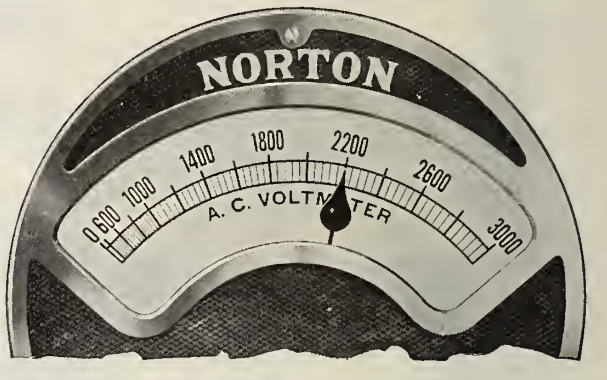
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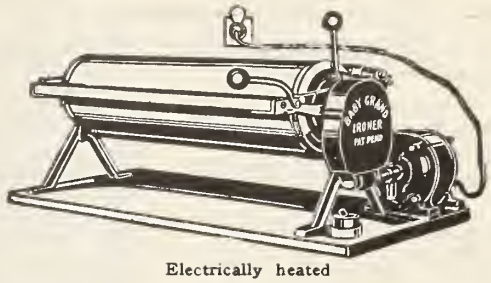
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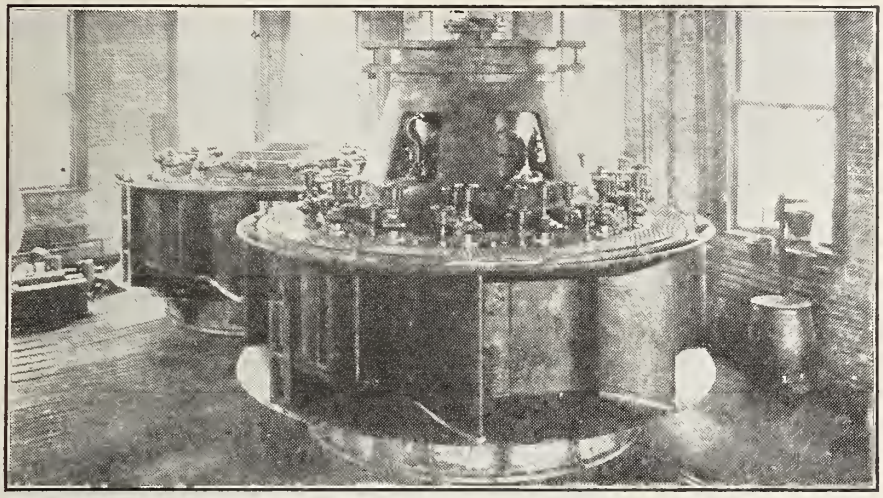
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"Electric Railway" by A. Morris Buck, M. E. Published in 1915 by McGraw-Hill Book Company, Inc. 390 pages, illustrated. Price $1.50.

"Elements of Radio Communication," by Ellery W. Stone. A book for the Engineer, Amateur, Student and Layman. 318 pages with 145 illustrations—39 plates. Second edition published March 1923, by D. Van Nostrand Company. Price $2.50.

"Engineering Electricity" by Ralph G. Hudson, S.B., 190 pages, illustrated. Published in 1920 by the John Wiley & Sons, Incorporated. Price $1.50.

"Examples in Alternating Currents," Volume 1, for Students and Engineers, by F. E. Austin, B.S., E.E. Published in 1915. Price 75c.

"Examples in Magnetism," second edition, for Students of Physics and Engineering, by Professor F. E. Austin. Published in 1916, price 75c.

"Handbook of Machine Shop Electricity" by C. E. Clewell. Published in 1916 by McGraw-Hill Book Company. 461 pages, illustrated. Price $1.50.

"Radiodynamics"—The Wireless Control of Torpedoes and Other Mechanisms, by B. F. Miessner. Published in 1916 by D. Van Nostrand Company. 206 pages, 112 illustrations. Price $1.00.

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"Theory and Calculation of Transient Electric Phenomena and Oscillations," by Charles Proteus Steinmetz. Third edition, revised and enlarged. Published in 1920 by McGraw-Hill Book Co., Incorporated. 696 pages, illustrated. Price $4.50.

"Testing of Electrical Machinery," for non-electrical students, by J. H. Morecroft. Fourth edition, revised and enlarged. Published by D. Van Nostrand Company, 1921. 220 pages, 111 illustrations. Price $2.50.

"The Electric Vehicle Hand-Book"—The only practical guide for the successful and economical operation of electrical vehicles and trucks, their motors, batteries and accessories —360 pages, 187 illustrations, published by H. C. Cushing, Jr., Pocket size—$2.00.

ELECTRICAL NEWS, 347 Adelaide St. W., Toronto, Ontario

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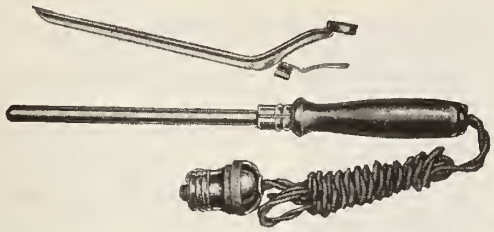
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HEATING APPLIANCES

LoXoN LAMP GUARD

THE KEY TO SAFETY

THE strongly made **LoXoN** Lamp Guards protect lamps from breakage. A **lock** stops theft and prevents unauthorized removal or changing of lamps.

Keeping lamps where they belong gives control over lamps. A lamp guarded by a **LoXon** Lamp Guard is always ready for use when wanted. And, too, the average life of each lamp is greatly lengthened because none is taken away or broken for want of the guard.

LoXon Lamp Guards are made in several styles to fit lamps of different sizes and to meet individual requirements. It is economy to use them.

Write for complete descriptive catalog and prices.

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Electrical Specialties of Quality

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No.	H.P.	Speed	Make
2	1	1800	Westinghouse
3	2	1800	T.H.E.
1	2	1800	Westinghouse
3	5	1800	Westinghouse
1	5	1800	T.H.E.
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60 cycle, 3 phase, 220 volt, Second Hand Motors

1	1	1800	T.H.E.
1	2	1800	C.G.E.
1	2	600	C.G.E.
1	2	1800	Chapman Walker
1	7½	1200	T.H.E.
1	8	1800	T.H.E.
1	15	1800	Crocker Wheeler with Starter complete.

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6	30	750	Crocker Wheeler " " "
1	15	1450	Westinghouse (new) " " "
1	50	720	Westinghouse H.S. " " "
2	50	750	Crocker Wheeler AQ " " "
3	20	750	Crocker Wheeler " " "

25 cycle, 3 phase, 220 volt, Second hand Motors

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Carbon, Graphite, Metal Graphite
For ALL TYPES of
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Made in Canada
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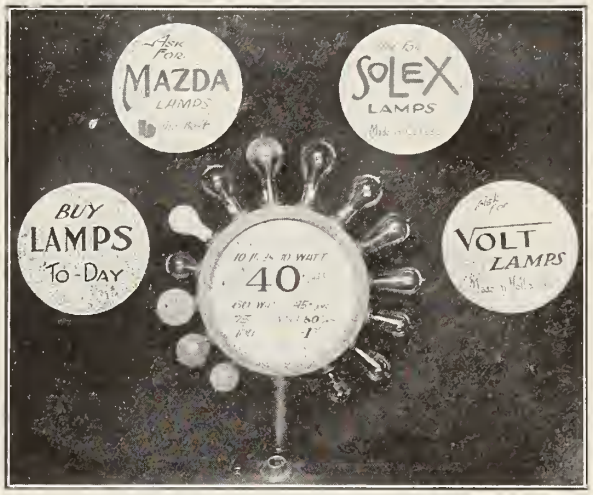
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POLYPHASE MOTORS



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They Keep-A-Running

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We have ready for shipment a counter display stand with a capacity of fourteen (14) lamps and above is shown an actual photograph of this stand. The cards shown are merely a suggestion of the advertising aids rendered by our display stand.

The stand is our own display and is sold exclusively by us. Is made of steel with a cast base and is finished in antique bronze. It is fourteen inches in diameter by twenty-two and a half in height with a base of ten inch diameter. The receptacles used are standard metal sign type finished to match the metal and a slip test socket is fitted in the base.

We offer this stand to dealers wired but less lamps at a price of Fifteen Dollars ($15.00) each F.O.B. Montreal. No dealer can afford to be without one as a reminder to his customers of the lamps required in the home. Extra lamp sales made through this medium in a very short time pay for the stand.

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STANDARD LIGHTING
WITH INCANDESCENT ELECTRIC LAMPS
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Electrical News, 347 Adelaide St. W., Toronto, Canada

For attaching purposes, use PAINE EXPANSION SHELLS, in concrete, brick, or stone. PAINE SPRING TYPE TOGGLE BOLTS work instantly in any position in any hollow material. PAINE OUTLET BOX AND FIXTURE HANGERS for lath and plastered or tile ceilings.

Made in Canada. Patented in Canada.

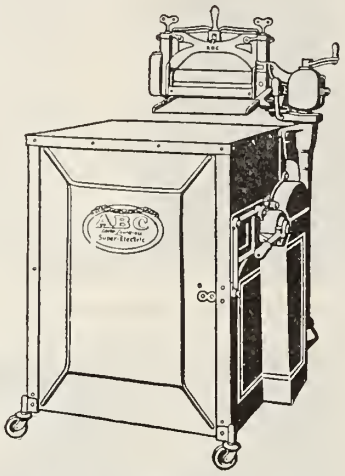
Requests for samples from live contracting firms are cheerfully complied with.

Distributors:
Aikenhead Hardware Co. Ltd., Toronto
THE PAINE CO. OF CANADA
George H. Broughton, Manager
122 Wellington St. W., Toronto, Ont., Can.

A Suitable Christmas Gift

A B C Electric Washer

Cylinder-Oscillator Dolly Models



Write for our trade list of Electrical Gifts

Prompt Shipments

The Masco Company, Ltd.

76-78 RICHMOND ST. EAST, TORONTO

Jobbers of Standard Electrical Merchandise

"Notice the Lighting Equipment"



Tallman Lighting Fixtures

Tallman Fixtures are more and more being recognized as a Quality Line. Fixtures that are well made from heavy weight metal, with lasting finishes. That you don't need to apologize for when offering your customer.

Not cheap, but economical.

MADE IN CANADA BY

TALLMAN BRASS & METAL Limited
Hamilton, Canada

The DUQUESNE Kitchen Luminaire

EQUIPPED with Cora Glassware, renowned for lighting efficiency and beauty, this most striking of Luminaires has won tremendous sales in every community where it has been introduced.

Backed by a Sales Campaign Plan that brings quick results.

Write, wire or telephone for sample and Plan.



Consolidated Lamp & Glass Co.

CORAOPOLIS, PA.

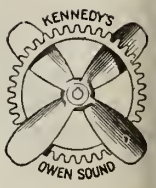
R. E. DAVIS, Canadian Representative
118 Wortley Road, LONDON, ONT.

GET YOUR CASTINGS *from* KENNEDY

OWEN SOUND

Manganese, Nickel, and other Alloy Steel Castings for every purpose. Also Aluminum, brass and bronze.

Large Castings a Specialty.

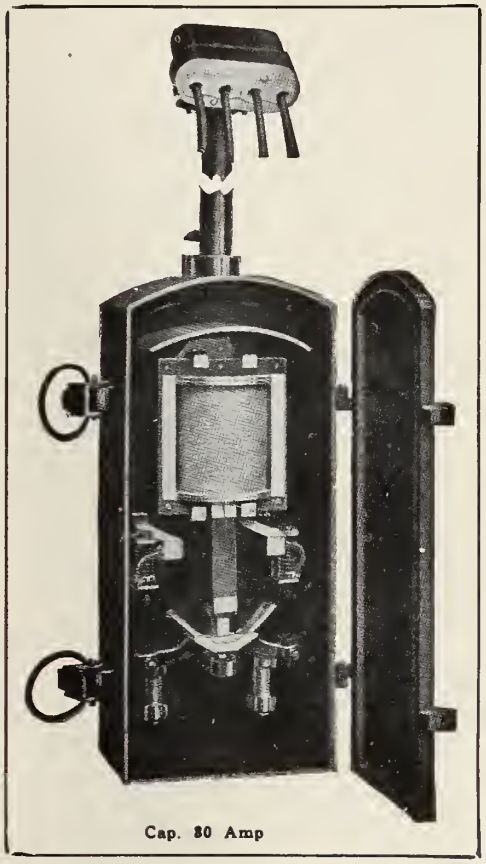


The Wm. Kennedy & Sons, Limited
OWEN SOUND ONTARIO.

Cobalt
M. B. SAUNDERS
8 Silver St.,

Montreal
H. C. KENNEDY
232 St. James St.,

Halifax
C. A. FOWLER
Tramway Bldg.,



Cap. 80 Amp

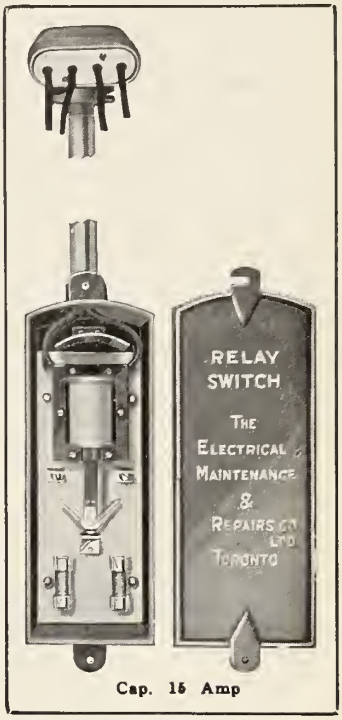
Engineers, Take Notice!

A new, smaller, simplified Remote Control Switch.

A young friend of our 30 Amp Switch—to do the many small jobs where the big fellow is too expensive.

Cheaper, yet perfectly dependable. Has been tested equal to five years' service.

For Street Lighting Control. Write about this.



Cap. 15 Amp

The Electrical Maintenance & Repairs Company, Limited

162 Adelaide Street West Toronto

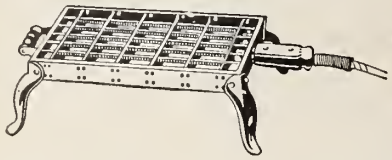
L. & N.

COMPANY, LIMITED, ST. JOHNS, QUE.

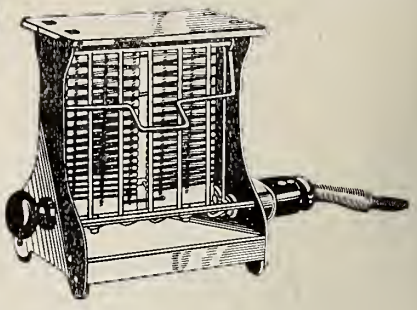
METALLIC AND NON-METALLIC FLEXIBLE CONDUIT, AND ARMORED CONDUCTORS

ALSO

FIBRE TWINES and CORDAGE



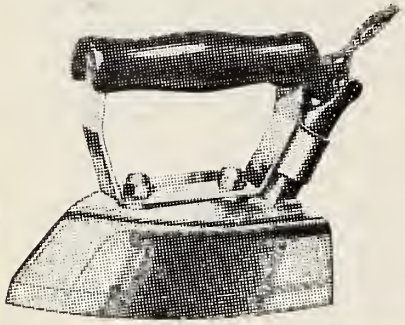
National ELECTRIC Appliances



The line that means more profit

Every day counts now! If you want to make more profit on bigger business—lose no time!

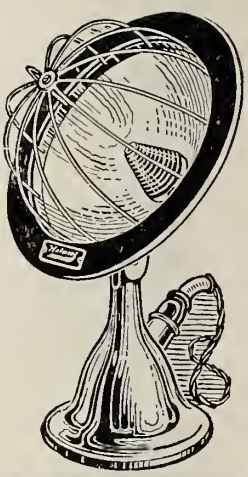
Write now to your jobber or direct to us for information about our



Special Christmas Package

an assortment of best sellers at a reduced price.

These favorite appliances are now available in Christmas boxes wrapped in attractive holly paper. Don't miss this opportunity.



National Electric Heating Co.
Limited
Toronto, Montreal, Winnipeg, Vancouver.

CABLE TERMINAL DEVICES





DISCONNECTING POTHEADS

The advantages of the disconnecting pothead should always be considered carefully before definite decision to use any other is made. The disconnecting feature adds little to the cost and its benefits are almost without limit, depending entirely upon the extent to which you take advantage of them.

The disconnecting pothead is the basis of a system of distribution that is more flexible than any other which could be installed or maintained or operated at anywhere near as low a cost.

Where potheads are to be installed near other manual switches the non-disconnecting pothead or plain cable seal is properly chosen; the disconnecting pothead is often used in connection with automatic switches, cutouts, etc., as it provides a disconnect which can be used in case of repairs or renewals being necessary.



POTHEADS, DISTRIBUTION BOXES



ON LINE EXTENSIONS OR IMPROVEMENTS

In planning for expansion and improvement of your distribution systems take advantage of the G & W Pothead Idea.

The value of your installation is dependent upon the adaptability of your distribution system at a time of sudden need.



Both normal conditions and the requirements of sudden demands, at a time of service interruption can be successfully met with a G and W equipped system. The experience of the G & W staff is at your service in planning complete equipment to meet the needs of specific installations.

G & W ELECTRIC SPECIALTY CO.
Chicago Illinois

Representatives in All Principal Cities
Powerlite Devices Limited, 62 Front St. W., Toronto
Powerlite Devices Limited, New Birks Bldg., Montreal
Bentz-Richardson Co. Ltd., 592 Notre Dame Avenue, Winnipeg, Man.
General Supplies, Limited, Calgary and Edmonton

G & W ELECTRIC SPECIALTY CO.

Electrical
Engineering Contracting News Merchandising Transportation

The Greatest Tube The Biggest Seller

In the Radio Field

$5.

Myers Dry Battery Tube 2½ Volt—¼ Ampere. For operation on 2 dry cells, Myers Universal Tube. For operation on either 3 dry cells or storage batery. Complete with mounting clips. Ready to be mounted on your set. No sockets or additional equipment necessary.

Briefly these are the qualities which made the Myers Radio Vacuum Tube the wonderful success it is:

Perfect detector. Unequalled as an amplifier. Noise-free. Gas-free. Uniform in operation. Interchangeable. Rigid in construction. Long life. Economical in current consumption. Easy to mount anywhere. Properly designed for radio. The only tube for radio frequency amplification. Made in Canada.

If you want to give your customers the very best, and at the same time make big profits, investigate our proposition, write to-day.

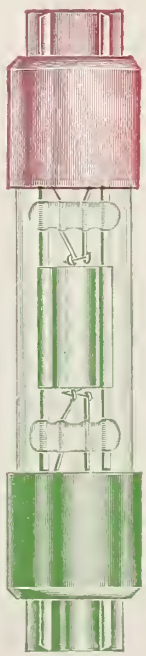
DO IT NOW



May we take this opportunity to wish the trade the Compliments of the Season and every Success for the New Year.

F. B. Myers Co. Ltd.
Radio Vacuum Tubes

Our address—240 Craig St. West, Montreal, Canada. Telephone Main 7822.



Full Size

phabetical Index to Advertisers, Page 8 Classified Directory to Advertisements, Page 70

ELECTRICAL CONDUCTORS
TELEPHONE TELEGRAPH AND POWER CABLES



Paper Insulated Sector L.C. Power Cable

Submarine Telephone Cable

Varnished Fabric Taped and Braided Power Cable

Paper Insulated Armored Power Cable

Paper Insulated L. C. Telephone Cable

Types of Electrical Conductors made in our Montreal Factory where we are staffed and equipped to manufacture Wires and Cables for every electrical need.

Northern Electric Company
LIMITED

MONTREAL TORONTO WINDSOR CALGARY
HALIFAX HAMILTON WINNIPEG EDMONTON
QUEBEC LONDON REGINA VANCOUVER

"Makers of the Nation's Telephones"

MANUFACTURING
Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and receiving Equipment

DISTRIBUTING
Construction Material
Illuminating Material
Power Apparatus
Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

Moloney Pipe Thawing Transformer

Don't wait until the cold weather is upon you; consider your requirements and order now.

Don't let the severe weather catch you unprepared, freezing up your pipes and causing you heavy expense.



We have a large stock of Service Type Transformers on hand ready to supply you at a moment's notice.

MOLONEY ELECTRIC COMPANY OF CANADA LTD.

Factory and Head Office: 213-219 Sterling Road, Toronto, Ont.

Branch Offices: Montreal, Halifax, Winnipeg

Agents: General Supplies Co., Calgary, Alta. Frank Darling, Vancouver and Victoria, B.C.

Thomson Electric Motors

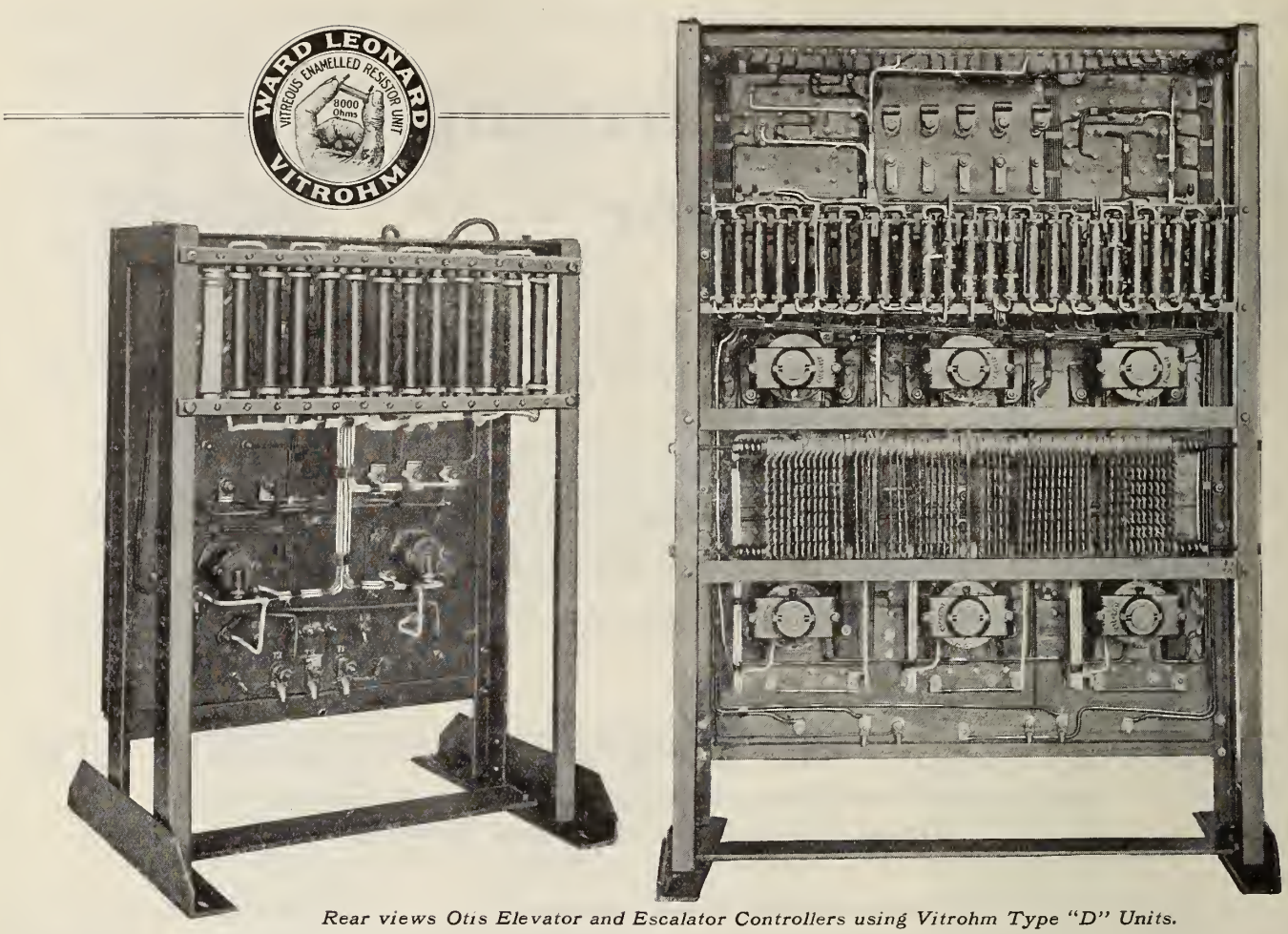
in use in many of the largest manufacturing plants in Canada

are built by

FRED THOMSON CO., LIMITED

ELECTRICAL ENGINEERS

7-13 ST. GENEVIEVE STREET MONTREAL



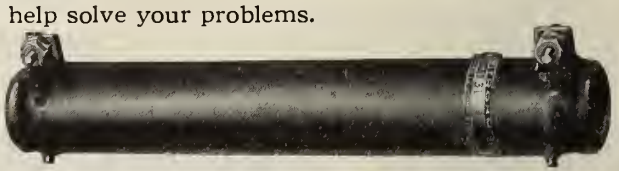
Rear views Otis Elevator and Escalator Controllers using Vitrohm Type "D" Units.

Ward Leonard Vitrohm Resistors

used in the controllers of

Otis elevators and escalators

RIGID requirements of city and state demand that every precaution of design and quality in elevator construction shall be taken to assure safety. For many years Otis Electric Elevators have been pre-eminent in the elevator field because of their superior safety and reliability in service. The use of Ward Leonard VITROHM Resistor Units in the controllers of Otis Elevators is significant of the dependable character of these resistors in severe, exacting and responsible service. Wound on a special porcelain-like body of great strength, the resistance elements of Ward Leonard VITROHM Units are sealed in glass-like tough vitreous enamel—perfectly and permanently protected against oxidizing or corroding moisture or gases. The value—like the dependable service—of Ward Leonard VITROHM Resistors is a fixed quantity. Let Ward Leonard resistance specialists help solve your problems.



Ward Leonard Type "D" Vitrohm Resistor Unit with screen terminals

Ward Leonard Electric Company

Mount Vernon, New York

For Canada:
WILLIS D. BISHOP, MONTREAL



"Oh Dad! This CELORON PANEL is the Best Christmas Present of All!"

Colors

Glossy Black—Mahogany or Oak

Standard Sizes

6	x	7
7	x	8
7	x	12
7	x	14
7	x	18
7	x	21
7	x	24
7	x	26
12	x	14
12	x	18
9	x	14

Immediate delivery on special sizes—drilling—engraving, etc.

ONLY seven more shopping days till Christmas! And most everyone frantically searching for presents!

This much is certain—if the recipient-to-be is a radio fan—nothing would please him better than a Condensite Celoron Radio Panel. Whether he is just commencing to build his set or whether he wishes to re-arrange his present one, a Celoron Panel will guarantee the utmost efficiency.

Get Your Share of This Business, Mr. Dealer!

Feature these panels NOW. The business is easily handled—the profits are large.

If you are not yet selling this line or if your stock is low, wire us immediately, and we'll rush your requirements.

DIAMOND STATE FIBRE CO. OF CANADA LIMITED

Wrigley Bldg., Carlaw Ave., Toronto

CONDENSITE CELORON

STANDARD RADIO PANEL



Peace on Earth—Good Will Toward Men

WHEN each of us enjoys the good will of our fellow men, we **will have** peace on earth. That time will come when we eliminate all causes of present day dissatisfaction and misunderstandings.

For example, we should put an end to those methods of charging for electrical service which breed ill will. No firm should feel that it is penalized for the bad load factors of its neighbor firms. The basis for billing should be above suspicion.

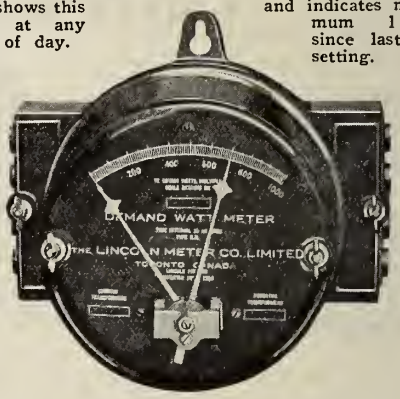
You central station managers know how to put an end to billing annoyances. You know that a Lincoln Maximum Demand Meter prevents mole hills of misunderstandings from growing into mountains of ill will.

A Lincoln Meter accurately **measures** each customer's maximum. It does so just as accurately as a watt hour meter measures total consumption. A Lincoln Meter and a Watt hour meter, working together, enable you to bill as **you** would want to be billed.

Our representative, when next in your territory, will gladly confer with you. Drop a card.

Hand now on left varies with load and shows this load at any time of day.

Hand now on right moves only to right and indicates maximum load since last resetting.



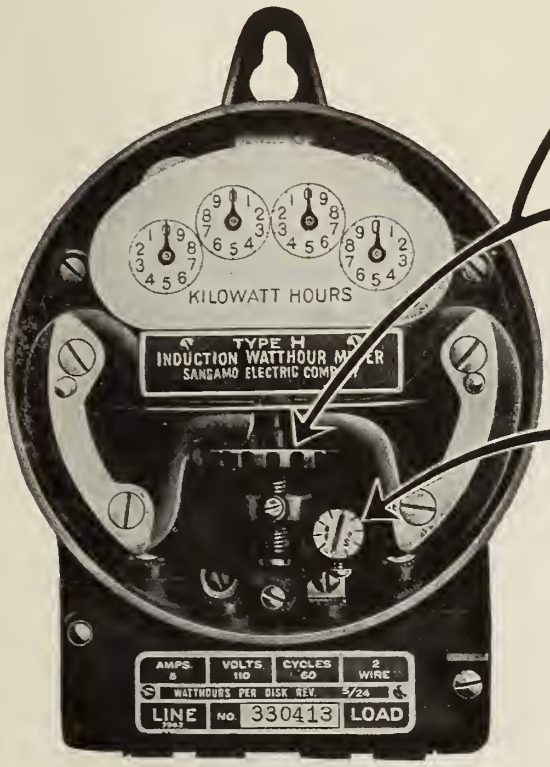
Write for the section (or sections) of the Lincoln Meter catalogue which interests you. SECTION I is a non-technical treatise on why demand should be measured; SECTION II, the technical treatise on demand measurement; SECTION III, Installation; SECTION IV, the Lincoln Graphic Demand Meter; SECTION V, the Lincoln method of Volt-Ampere Demand Measurement (Power Factor recognition); and SECTION VI, the Lincoln Split Core Transformer and Demand Ammeter.

The Lincoln Meter Co., Limited
72-74 Stafford Street, Toronto, Canada
Cable "Meters" Toronto. Phone Adelaide 3969

The Lincoln Demand Meter is available with the Sangamo energy Meter—sold as the **Lincoln-Sangamo** DEMAND ENERGY **meter**

Lincoln MAXIMUM DEMAND meter

Adjustment Simple & Easy



Full Load Adjustment
Loosen Clamp Screw and Turn Disc

Light Load Adjustment
Graduated Micrometer

SANGAMO

The Sangamo method of meter adjustment on the Type "H" alternating current Watthour meter eliminates all guesswork. It provides a positive, easy and simple means of adjustment which saves time and trouble.

Light Load Adjustment, as shown in the above illustration, is accomplished by loosening a clamp screw and turning the micrometer screw a fixed amount for each per cent of desired correction. One complete revolution of the micrometer screw produces an approximate change of 2½ per cent. Consequently each divisional turn is equal to ¼ of one per cent change.

Full Load Adjustment is accomplished by loosening the clamp screw and turning the iron disc indicated above. Turning the iron disc one way brings it closer to the magnets, thereby shunting magnetic flux away from the disc and speeding up the meter. Turning it the other way moves the iron disc a greater distance from the magnets, strengthens the damping flux through the disc and slows up the meter. When adjustment is completed the clamp screw locks it in position. **All this is accomplished without moving the magnets.**

After the meter is once adjusted the entire moving element may be removed without affecting the accuracy of any adjustment.

Simplified adjustment is only one Sangamo feature which you will appreciate.

Ask for Bulletin No. 5518 fully describing Type "H" alternating Current Watthour meters.

The Sangamo Energy Meter is available with the Lincoln Demand Meter sold as the **Lincoln-Sangamo meter**

Sangamo Electric Company of Canada, Limited

2074

Factory: TORONTO **Head Sales Office:** MONTREAL

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Rubber Covered Wires and Cables

FOR POWER, LIGHT AND TELEPHONE WORK

Incandescent Lamp Cord, Flexible Switchboard Cables, Special Cords and Cables for all kinds of Electrical Work.

Prompt Shipments from Canadian Factory.

BOSTON INSULATED WIRE & CABLE CO., Limited

Canadian Office and Factory, HAMILTON, ONT.

GALVADUCT



The Canada Cement Building, Montreal. Barott & Blackader, Architects

"GALVADUCT"

The most perfect interior construction conduit on the market. Recognized as the standard of high quality.

Always specify Galvaduct or Loricated CONDUITS

"LORICATED"

A high class interior construction conduit of the enamelled type, proof against acid or other corrosive agents.

If your jobber cannot supply you—write us.

LORICATED

CONDUITS COMPANY LIMITED

TORONTO MONTREAL

Western Sales Office: 602 Avenue Building, Winnipeg



The life of Motors *as well as* Men

MOTORS, like men, need air. Without cooling air the heat generated in motor operation would rapidly deteriorate and destroy the insulation.

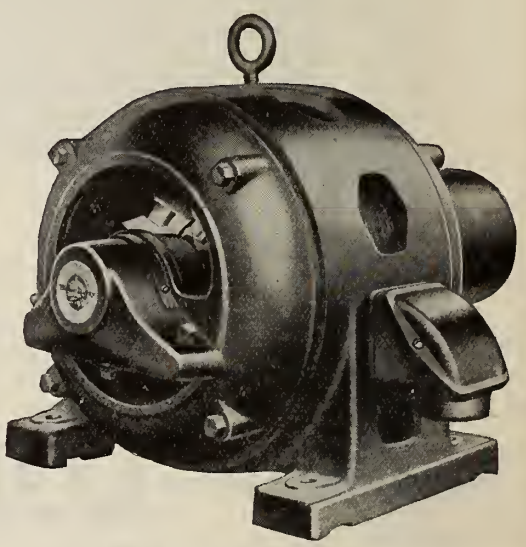
Like many simple ideas, the importance of really efficient motor ventilation was never generally realized until its remarkable results were demonstrated in the new Wagner Pow-R-full Motor.

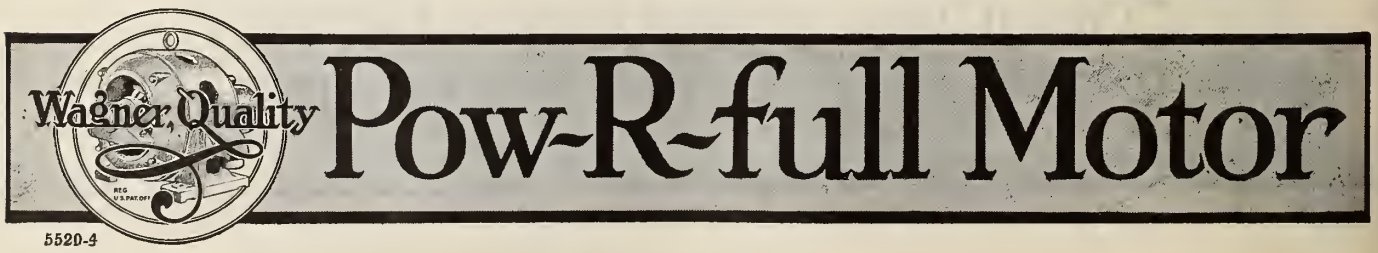
Here is a motor that will carry *more load* —stand up longer under severe service conditions.

Contains every practical feature of advanced motor design. High efficiency, high power factor, constant speed, high torque, great strength and extraordinary overload capacity.

Write for Bulletin 13213.

WAGNER ELECTRIC MFG. CO. OF CANADA, LIMITED
Power Bldg. Montreal 217 Dundas St., E., Toronto





5520-4

At No Season of the Year is Light so Important as During the Christmas Festivities

Our Christmas advertisement which will appear during the week of Dec. 16th, contains the following message:

> "Since the night long ago, when a glowing star guided the Magi to the Child in Bethlehem, the happiness of Christmas has been told in light. Keep the cheer of Christmas tide in your home throughout the year. Edison MAZDA Lamps will make each room more cheerful and comfortable, and add to childhood's happy memories."

EDISON MAZDA LAMPS

Will be in larger demand than ever

STOP for one moment and consider the number of families in your neighborhood who will require from one to a half dozen new lamps during the Christmas holidays. The number is amazing. How to get them into your store is the question. And the answer to this is simple.

Consult your Blue Book as to the date the Edison Mazda advertisement will appear in your local paper, then arrange to insert a tie-in advertisement on the same page. Next see that Edison Mazda Lamps are displayed prominently, using the window trim and display matter which has already been sent you. Next oil up the old cash register and go to it.

"Made in Canada" by

EDISON LAMP WORKS

of

Canadian General Electric Co., Limited

Johnnie Hotpoint

Wishes all his Customers a Busy Christmas and a Prosperous New Year

AT no season of the year do Hotpoint "Servants for the Home" have such a ready market as Christmas. They combine usefulness with distinction. It is a sign of good taste to give Hotpoint appliances and a compliment to receive them. They make the spirit of Christmas last the whole year through.

Hotpoint Christmas Advertising is seen by over a Million People

TO capitalize on our national advertising is simple. Merely display Hotpoint appliances prominently in your window and on your counter. The buying public are thoroughly sold on the superiority of the Hotpoint line. Your store is the place where the buyer and the product are brought together, providing you advertise the fact that you handle the famous Hotpoint line, by displaying it in such a way that not only your present customers are made acquainted with the fact, but the passers-by. Remember the percentage of sales made from the sidewalk, is higher than ever at this time of the year.

HOTPOINT DIVISION
of
Canadian General Electric Co., Limited

For Last Minute Requirements Phone Your Jobber

YOU run no risk of overloading, because Hotpoint appliances always have a rapid turnover at any time of the year. Don't lose the opportunity of making this a record Christmas by not having a sufficient supply of Hotpoint appliances.



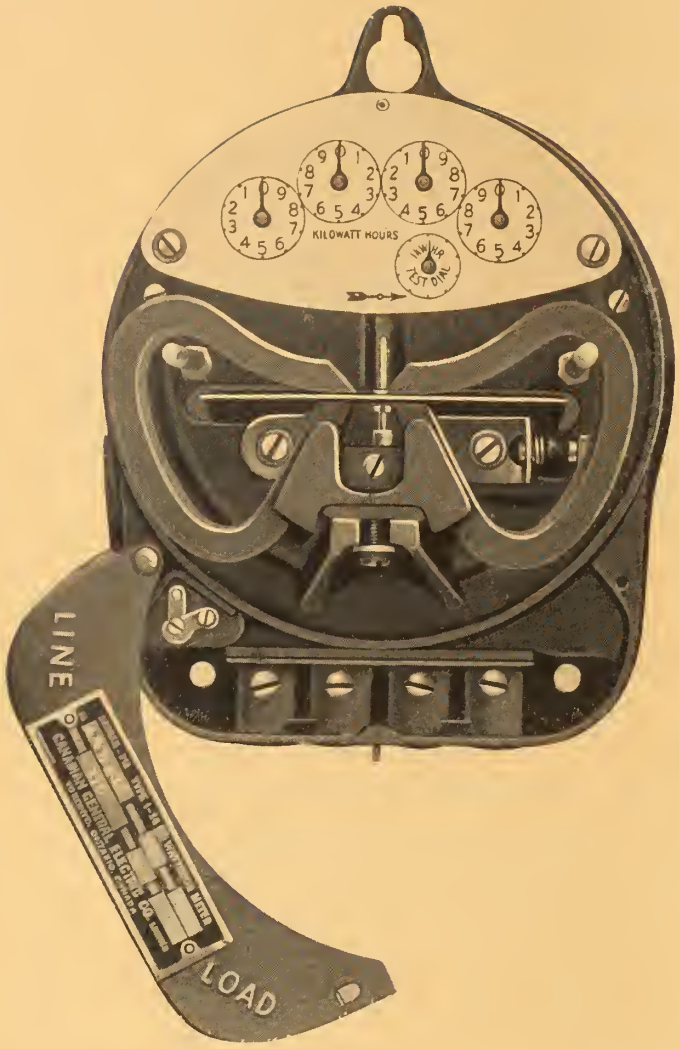
A Sales Suggestion

TRY the departmental store idea. Group Hotpoint appliances in such a way that kindred devices are kept together. Counter cards will add to the value of this group idea. You will help prospective customers to select gifts by arranging articles suitable for "Mother," "Father" "Him" and "Her" and so on, on separate tables. Have some attractive price tags made up, and wrap all parcels in Christmas wrapping paper.

HOTPOINT DIVISION

of

Canadian General Electric Co., Limited



I-14

Watthour Meters

Ten years of successful service show the I-14 Meter to be as nearly perfect as present day experts in meter design and manufacture can produce. It represents the culmination of a long period of development by the Canadian General Electric Company, which has 35 years of experience in watthour meter building.

Accuracy in Service

THE standard by which a watthour meter should be judged is not its performance under ideal conditions. What is its accuracy under the less favorable conditions such as: inductive loads, varying voltage, frequency or temperature and abnormal wave forms? And will it maintain its initial accuracy indefinitely?

The I-14 Meter fulfills these requirements. Its freedom from the effects of these abnormal conditions and its ability to maintain its high initial accuracy over continued periods of service, simplifies the meter problem of the central station.

"Made in Canada"

Canadian General Electric Co., Limited

HEAD OFFICE TORONTO

Branch Offices: Halifax, Sydney, St. John, Montreal, Quebec, Cobalt, Ottawa, Hamilton, London, Windsor, South Porcupine, Winnipeg, Calgary, Edmonton, Vancouver, Nelson and Victoria.

JACK FROST-



It's the quality in the Peirce that protects

This imp of mischief is ready to start his bedevilment—winter is coming. But the wise engineer who has prepared for this enemy is carefree.

Frost cannot do damage where

The Peirce

is on the job. The spiral steel spring thread protects your lines.

Jack Frost has found his match in Peirce pole line hardware.

The Slater double hot-dip galvanizing process guarantees years of continuous service. The Peirce is the very highest development in pole line hardware. Write for a copy of a dependable booklet on "Secondary Construction of Proved Value."

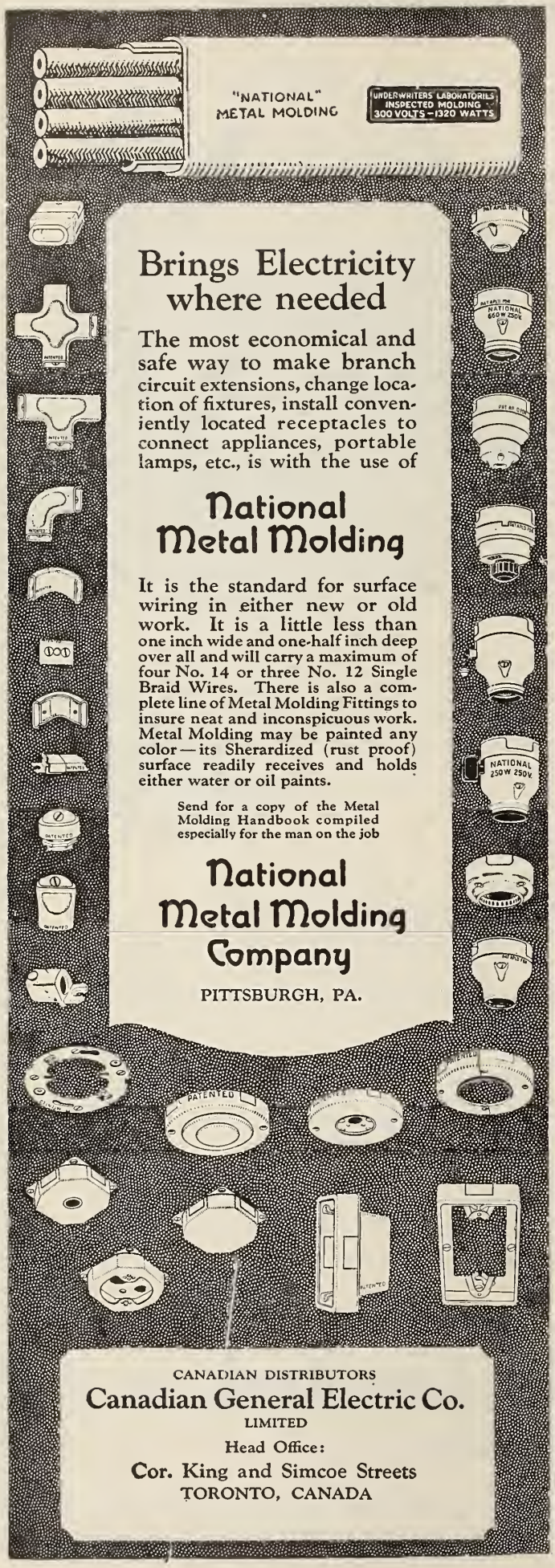
Every piece of Peirce pole line hardware is marked with the words "Peirce" and "N. Slater Co., Limited."

Ask your Jobber

Peirce brackets are made only by N. Slater Co., Ltd.

N. Slater Co. Limited

Hamilton, Ontario



Brings Electricity where needed

The most economical and safe way to make branch circuit extensions, change location of fixtures, install conveniently located receptacles to connect appliances, portable lamps, etc., is with the use of

National Metal Molding

It is the standard for surface wiring in either new or old work. It is a little less than one inch wide and one-half inch deep over all and will carry a maximum of four No. 14 or three No. 12 Single Braid Wires. There is also a complete line of Metal Molding Fittings to insure neat and inconspicuous work. Metal Molding may be painted any color—its Sherardized (rust proof) surface readily receives and holds either water or oil paints.

Send for a copy of the Metal Molding Handbook compiled especially for the man on the job

National Metal Molding Company

PITTSBURGH, PA.

CANADIAN DISTRIBUTORS

Canadian General Electric Co.
LIMITED
Head Office:
Cor. King and Simcoe Streets
TORONTO, CANADA

NUMBER 8

This is the eighth of a series of ten advertisements

The Line that R. and I. E. Co. Builds!

This is the Steel Base

That carries the R. & I. E. Interchangeable Insulator Units with Forged Steel Pins and Pressed Steel Caps. No clamps, no screws

That supports the Type "IB-2" Horn Gap Switch. (Bulletin 1331)

and the Type "WB-2" Horn Gap Arrester (Bulletin 1600)

and the Type "F-2" Fuse Holder with Glass Cartridge Fuse. (Bulletin 1500)

That makes up

One of the many combinations obtainable with R. & I. E. Interchangeable Insulator Unit Equipment. Built for a particular purpose—to give service at a minimum cost

Interchangeable Unit Substation Combinations that R. and I. E. Co. Builds

R & I E Interchangeable Insulator Unit Equipment for outdoor service includes Bus Supports, Disconnecting Switches, Air Break Horn Gap Switches, Choke Coils, Fuse Holders, Lightning Arresters, Substation Combinations and Outdoor Steel Substations.

Manufactured by

Railway and Industrial Engineering Co.
Greensburg, Penna.

8



Cat. No. 5056

A New Heavy Design which is proving to be popular for 300 W or 500 W Lamps Supplied with either Holophane Refractor or Globe.

Cat. No. 5056

We also solicit your enquiries for the products of
Weston Electrical Instrument Co.
The Bristol Co.
Metric Metal Co.
Albert & J. M. Anderson Mfg. Co.
Philadelphia Electrical & Mfg. Co.
Railway & Industrial Engineering Co.
General Devices & Fittings Co.
G & W Electric Specialty Co.

Powerlite Devices, Limited

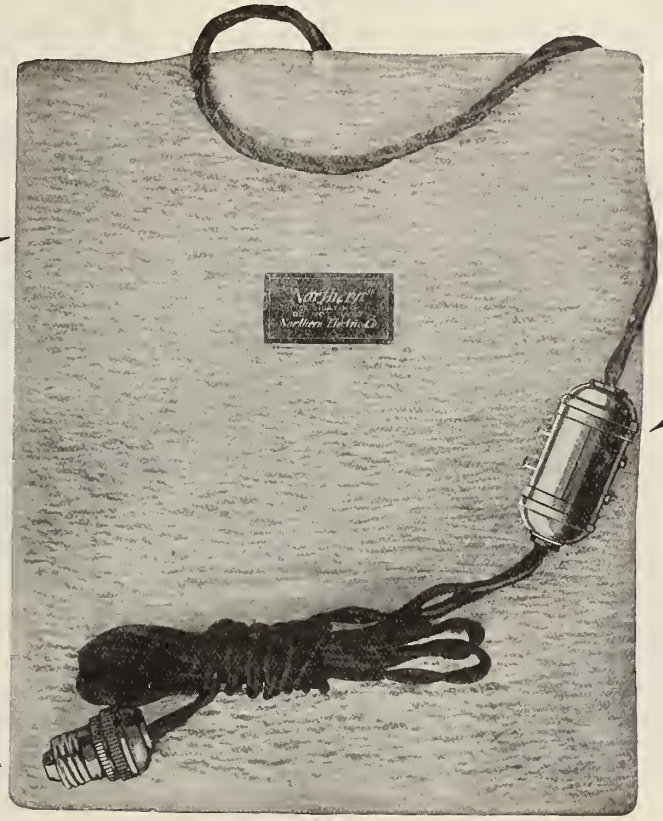
Formerly

A. H. Winter Joyner Limited

62 Front St. West, TORONTO
New Birks Bldg., MONTREAL

"Northern" Pads and Curlers

Covered with soft eiderdown
(In assorted dainty Colors)

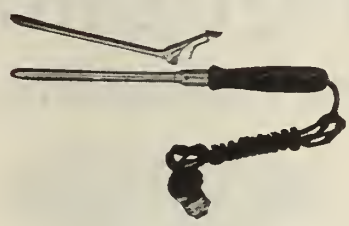


Three Heat C-H switch

Two-piece plug— Ten feet of cord

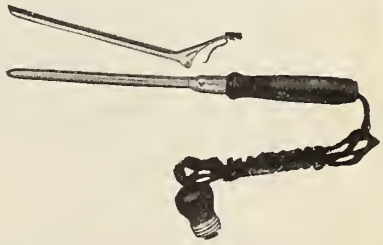
Size 12" x 15"

No. 77
Waver and Curler 10½ x 5/16



USEFUL AND DEPENDABLE ELECTRICAL —GIFTS—

No. 55
Waver and Curler 11½ x ⅜



Distributed by

Northern Electric Company
LIMITED

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HALIFAX HAMILTON WINNIPEG EDMONTON
QUEBEC LONDON REGINA VANCOUVER

"Makers of the Nation's Telephones"

MANUFACTURING
Manual Telephones
Automatic Telephones
Wires & Cables
Fire Alarm Systems
Radio Sending and-receiving Equipment

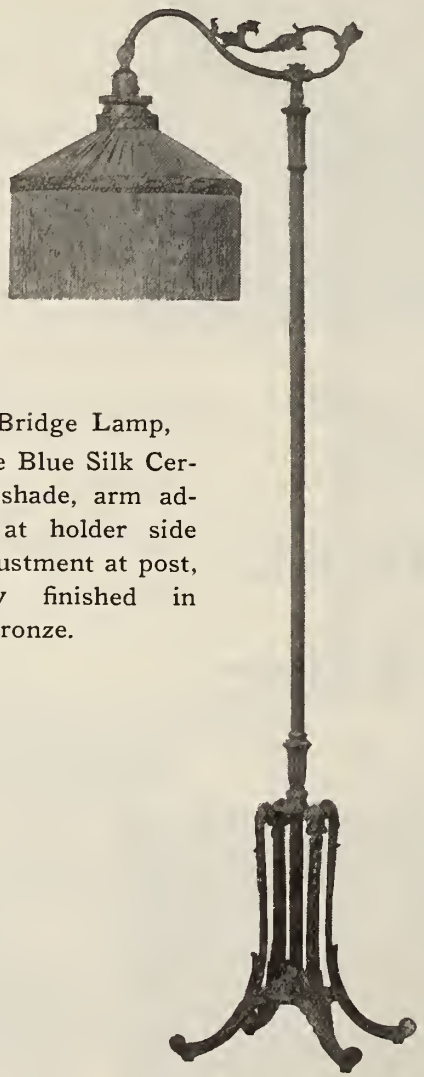
DISTRIBUTING
Construction Material
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Household Appliances
Electrical Supplies
Power & Light Plants
Marine Fittings

Dealers apply to nearest branch house for prices and discounts

Notice the Lighting Equipment Everywhere you go

Select from the Crown Lines. By doing so you can procure the best.

Our lamps are designed to answer the lighting requisites of homes, particularly adaptable to the much desired harmony in house furnishing.



P. 519 Bridge Lamp, Handsome Blue Silk Cerise lined shade, arm adjustment at holder side swing adjustment at post, beautifully finished in Chrome Bronze.

Crown Electrical Mfg. Co.
LIMITED
Brantford **Ontario**

"Notice the Lighting Equipment"

RayLite



RayLite the Lighting Fixture for High Class Installations

Note the following representative users, no other unit can produce such evidenc of favor:

St. Catharines .....Technical School
Kitchener-Waterloo ..Technical School
Hamilton .....Technical School
Sudbury .....Technical School
Toronto .....Public Schools
Hamilton .....Public Schools
Ottawa .....Public Schools
Royal Bank, Bank of Hamilton

TALLMAN BRASS & METAL Limited
Hamilton, Canada

The DUQUESNE Kitchen Luminaire

TESTED and proved, and in action today, the Sales Campaign Plan behind this remarkable Luminaire is bringing results, in volume and speed, beyond expectations.

You will want to secure your share of the profits that this plan is producing.

Write, wire or telephone for demonstration sample. Get the details of the Plan.



Consolidated Lamp & Glass Co.
CORAOPOLIS, PA.
R. E. DAVIS, Canadian Representative
113 Wortley Road, LONDON, ONT.

Toronto's New Schools



Riverdale Technical School, Toronto

Are Being Equipped with Cased-Glass Units

Jefferson units
were selected on their
merits over all
Units Submitted

Write for illustrations
of Jefferson Units



No. 399½

Efficiency
Service
Cleanliness
Appearance

Sold thru the
Electrical Trade Only

Installation by McDonald & Willson, Ltd., Toronto

We Sell the Glassware only

FACTORY & HEAD OFFICE
388 CARLAW AVE
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DOWN-TOWN SHOWROOMS
164 BAY ST. TORONTO

Jefferson Glass
MADE IN CANADA
COMPANY LIMITED

285 BEAVER HALL HILL
MONTREAL
272 MAIN STREET
WINNIPEG
510 HASTINGS ST. W.
VANCOUVER

CANADIAN PORCELAIN CO.

LIMITED

HAMILTON - CANADA

Manufacturers of High and Low Tension Porcelain Insulators

Design
Value
Service

Win-Joy
PRODUCTS

And
Made in
Canada

STREET LIGHTING EQUIPMENT

WINTER JOYNER
COMPANY, LIMITED

The Address is
455 KING ST. WEST
TORONTO

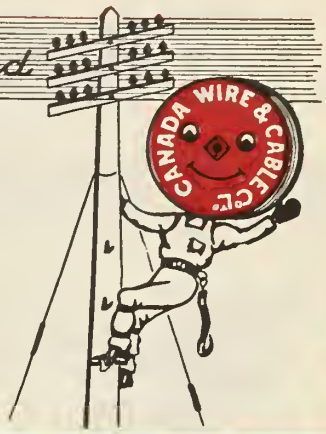
The Telephone is
ADELAIDE 7880

"Reel Service"

From Coast to Coast

Canada Wire & Cable Co. Limited

Halifax Montreal Toronto Regina
Winnipeg Calgary Vancouver

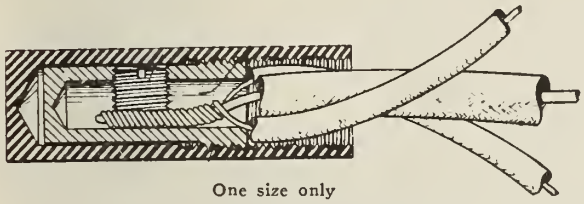


Get Our New Hand Book

This handy little book is full of valuable information for the electrical engineer, contractor, construction man, repair man, etc., and a copy will be gladly sent on application to our nearest branch. Write or phone for it today.

THE MARR

Insulated Wire Connector



One size only

Takes any fixture condition

Approved by Hydro and Underwriters' Laboratories

A Canadian Made Product

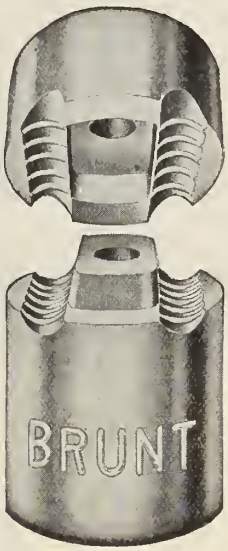
Why take a chance with foreign products, and send Canadian money to pay foreign workmen? Canadians can give you a far superior article, and help keep our money at home where it is needed.

Ask Your Jobber or Send for Sample

Sole Manufacturer

W. P. MARR 102 Russett Ave.
Toronto - Ont.

BRUNT



HIGHEST QUALITY

PORCELAIN

KNOBS
TUBES
CLEATS
AND
SPECIALTIES

CANADIAN REPRESENTATIVES
Duggan Import Sales Co.,
162 King Street, West,
Toronto, Ontario
Russell Fowler Co.,
306 Notre Dame Avenue,
Winnipeg, Man.

THE BRUNT PORCELAIN CO.
Columbus Ohio

The Star Porcelain Company

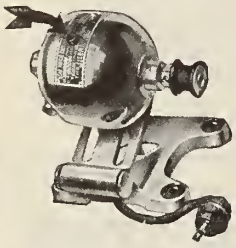
TRENTON, N. J.

Manufacturers of Electrical Porcelain Specialties. Also specialize in the manufacture of heater bricks for electric ranges.

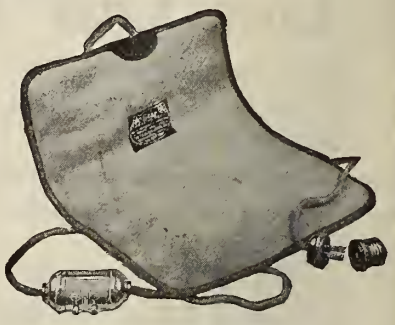
The STAR-Rite Line

offers most timely Christmas suggestions—and at retail prices that stimulate buying

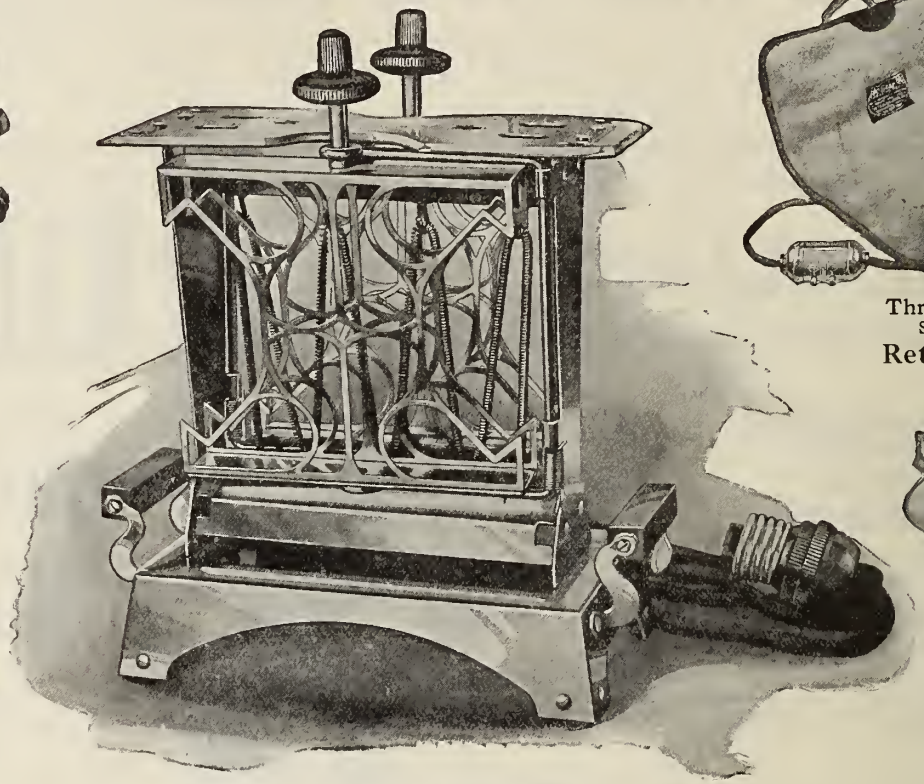
Approved by H.E.P.C.



All Nickelled
Sewing Motor
with fool-proof any speed, foot rheostat
Retails - $18.50

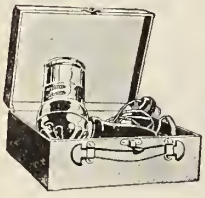


Three-Heat Pad
Size 12" x 15"
Retails - $9.00





Handsome
All Nickelled
Waffle Iron
Complete with Tray
Retails-$12.00



Hair Dryer
Universal Motor
Aluminum Construction.
Retails - $17.50

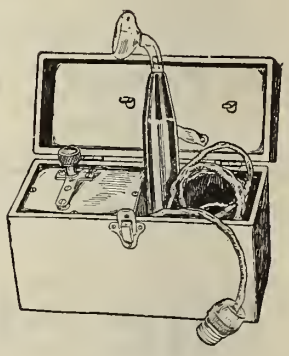
Reversible Toaster
New Model
Retails - $6.75



Motor Vibrator
Complete with Applicators
Retails - $17.50



Model D Heater
12" Copper Reflector
Retails - $6.75



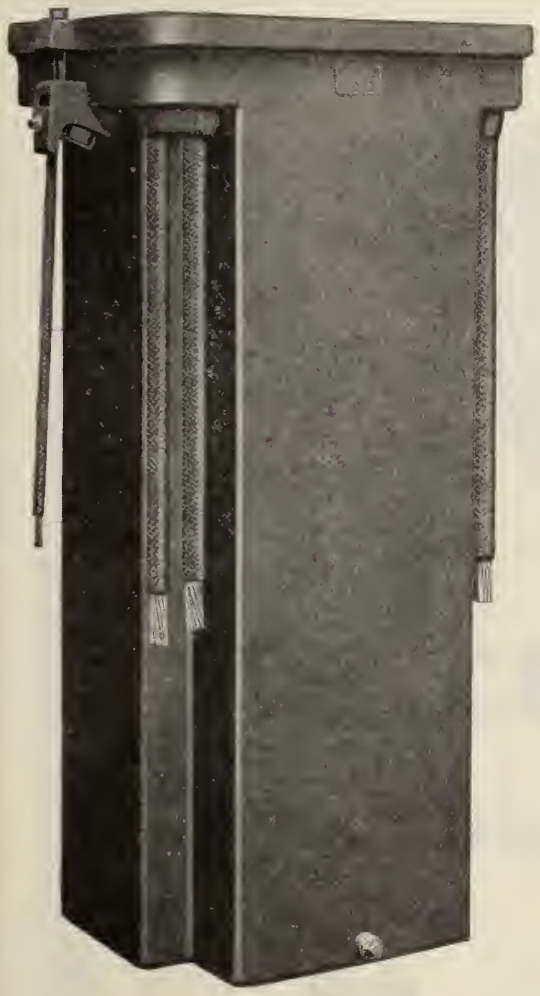
Violet Ray
Cabinet Style
Retails - $17.50

Absolutely Guaranteed

THE CANADIAN FITZGERALD MFG. CO.

95 King Street East, Toronto

Westinghouse Type S Distribution Transformers



The reliability of Type S Transformers results from the quality and disposition of the insulation, and the method of winding and assembling the coils.

Regardless of weather conditions Type S Transformers give the same reliable, efficient service.

Canadian Westinghouse Co., Limited, Hamilton, Ontario

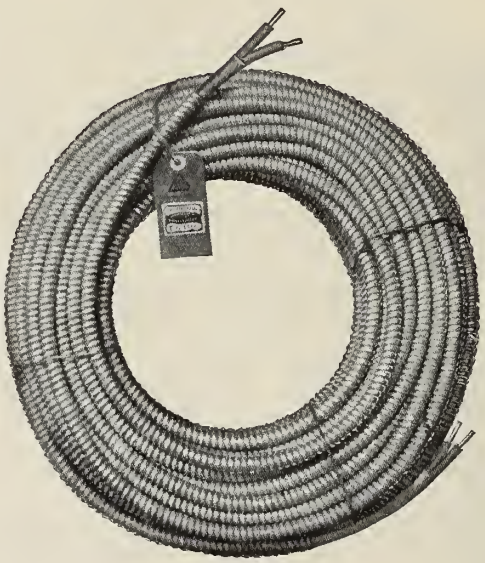
TORONTO, Bank of Hamilton Bldg.
HALIFAX, 105 Hollis St.
CALGARY, Canada Life Bldg.
MONTREAL 285 Beaver Hall Hill
FT. WILLIAM, Cuthbertson Block
VANCOUVER, Bank of Nova Scotia Bldg.
WINNIPEG, 158 Portage Ave. E.
EDMONTON, 211 McLeod Bldg.
OTTAWA, Ahearn & Soper, Ltd.

Repair Shops

MONTREAL, 512 William St.
WINNIPEG, 158 Portage Ave., E.
VANCOUVER 1090 Mainland St.
TORONTO, 366 Adelaide St. W.
CALGARY, 320 8th Avenue West

Westinghouse

A
SYMBOL OF SAFETY



"TRICABLE"
Armoured Conductors

Selling Agents—

Conduits Company Limited

33 Labatt Avenue, TORONTO

Western Agents

COCHRANE STEPHENSON CO.

WINNIPEG - VANCOUVER

Electrical
Mechanical
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Directory of Engineers
and Special Representatives

Testing
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Canadian Water-Powers Agency
(Registered)
CHARLES BRANDEIS, C.E., E.E.
Consulting Engineer
We negotiate sale and purchase of developed and undeveloped water-powers.
Estimates made on power available and costs of development.
390 Phillips Place, MONTREAL
Telephone Uptown 2825

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Special attention given to Patent Litigation
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Confederation Life Bldg., TORONTO

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INSPECTION ENGINEERS
Inspection and Tests at Manufacturers'
71 King St. West, Hamilton, Ont.

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Power Building, MONTREAL

Electrical Testing
Laboratories
"Electrical, Photometrical and Physical Tests and Inspections".
80th Street and East End Avenue,
New York, N.Y., U.S.A.

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M.E.I.C., A.M.I.C.E.

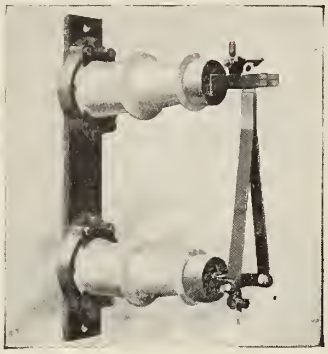
This Space is Available

!

This two color attractive space is available at a cost of only $60.00 per inch, per year of 24 issues reaching 3,500 electrical men throughout Canada. The above firms whose cards are shown find this small space especially valuable and many of them have been with us for years.

Write to-day!

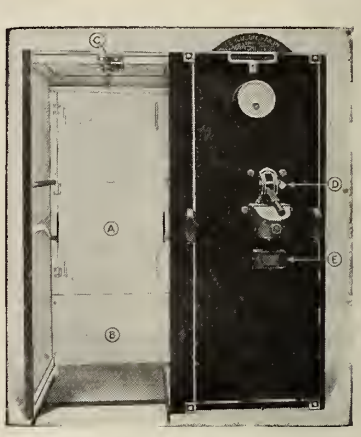
Electrical News
349 Adelaide Street West, Toronto



33,000 volt Disconnecting Switch (indoor type)



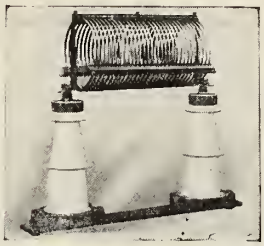
Standard Oil Immersed Circuit Breakers, rupturing capacities 35,000/300,000 K.V.A.



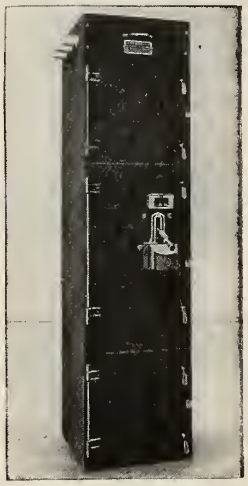
Truck type Switchboards



Direct-current Switchboard



33,000 volt Choke Coil (indoor type)



Standard Non-Interlocked Ironclad Cubicle



88,000 volt Automatic Air Break Switch (outdoor type

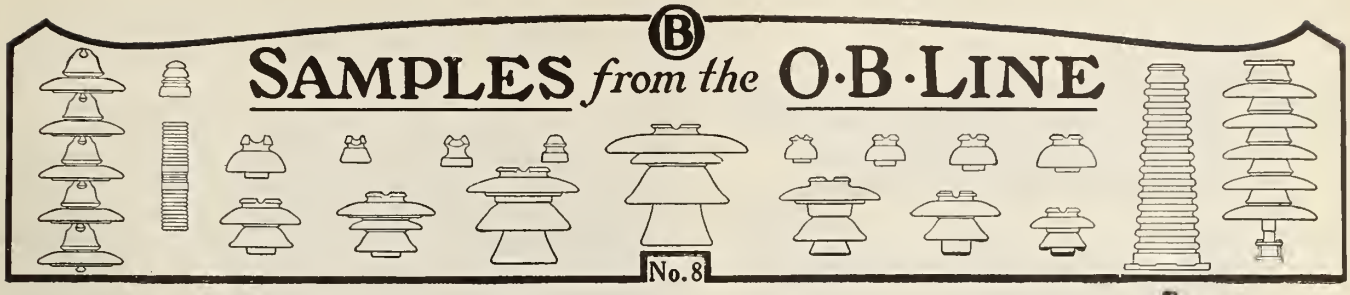
FERGUSON, PAILIN LTD.

Canadian Office and Warehouse:

321 KING STREET EAST, TORONTO, ONT.

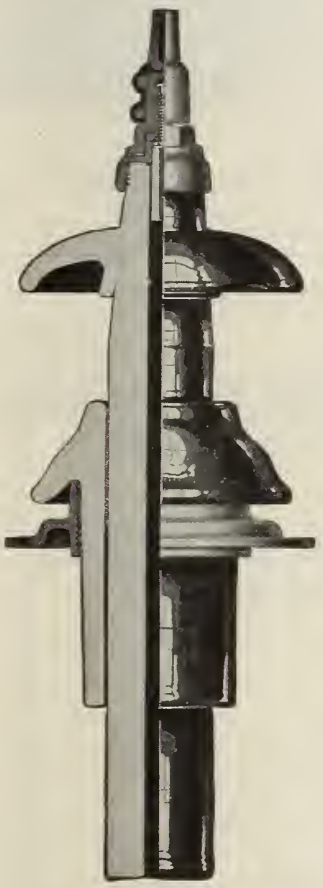
Frank H. Girdlestone, 132 James St., Winnipeg, Representative for Manitoba and Saskatchewan

Lancashire Dynamo & Motor Co. of Canada, Limited, 275 Craig St., Montreal, Representatives for Province of Quebec



Wall and Roof Insulators

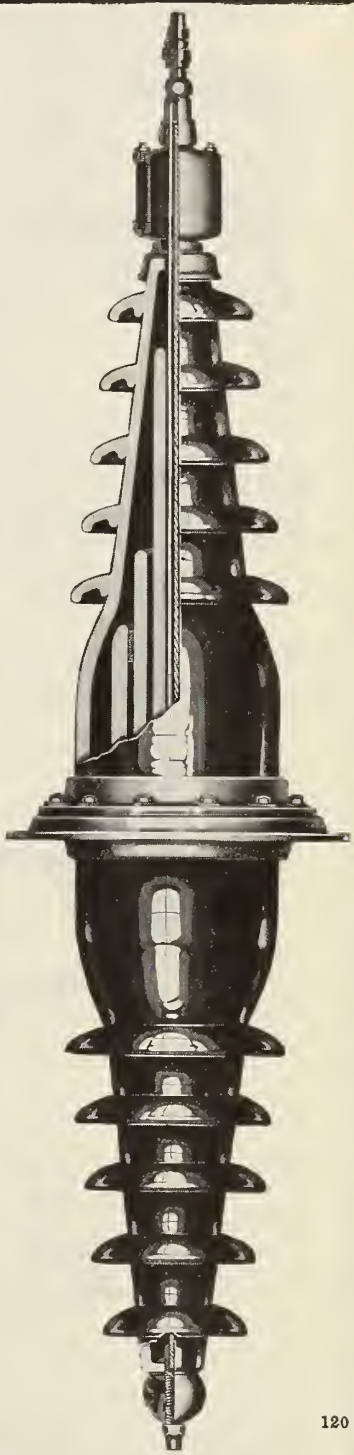
for every operating condition



TWO samples from the large line of O-B wall or roof insulators are shown on this page. On the left is an insulator of the type known at the factory as "tube bushings." These are made of one or more long porcelain tubes or sleeves, with one or more porcelain flanges or rain sheds, and are rated from 11,000 to 110,000 volts, depending on the length and number of the tubes. The insulator illustrated is rated at 33,000 volts.

On the right a "filled bushing" is shown. Insulators of this type are filled with insulating oil or compound, and are usually used for 100,000 volts or higher potentials.

Insulators of both these types are widely used for outdoor transformers and oil switches as well as for wall and roof entrance installations.



120

Dominion Insulator & Mfg. Co. Limited

(Manufacturing Ohio Brass Company Products in Canada)

Niagara Falls - - - - - - Ontario

Chromel
MARSH ALLOYS

Stands the Heat



It won't scale off. It stands high temperatures better than any other alloy known. It is made in all sizes for Electrical Heating devices. Can you use an element like this?

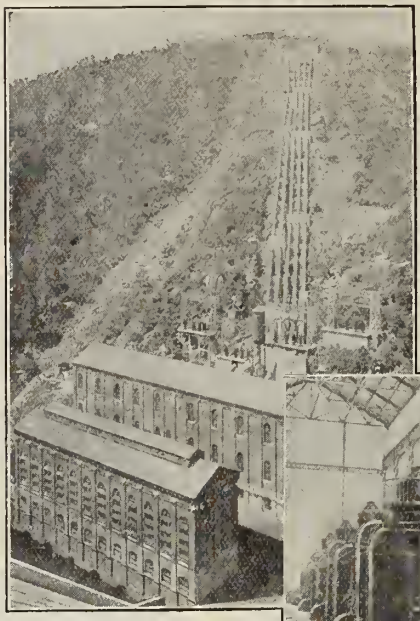
Write for full particulars.

MADE IN CANADA

HIRAM WALKER & SONS METAL PRODUCTS, LIMITED

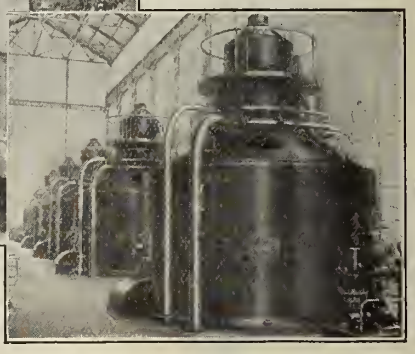
WALKERVILLE, ONTARIO.

Smith Hydraulic Turbines



Shown in illustration are developing 114,000 H.P. under 600 ft. head in the plant of Georgia Ry. & Pr. Co., Tallulah Falls, Ga.

These turbines have established a most remarkable record for economical and continuous service.



If interested in modern hydraulic development, write Dept. "N" for Bulletin.

S. Morgan Smith Co., York, Pa.

H. B. Van Every, Canadian Reprerentative
405 Power Bldg., Montreal, P.Q.

Made in Canada Conduit

Approved by the Hydro-Electric Commission of Ontario
Labelled under supervision of Underwriters' Laboratories

XCELADUCT

GALVANIZED

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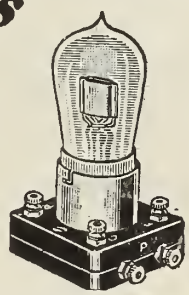
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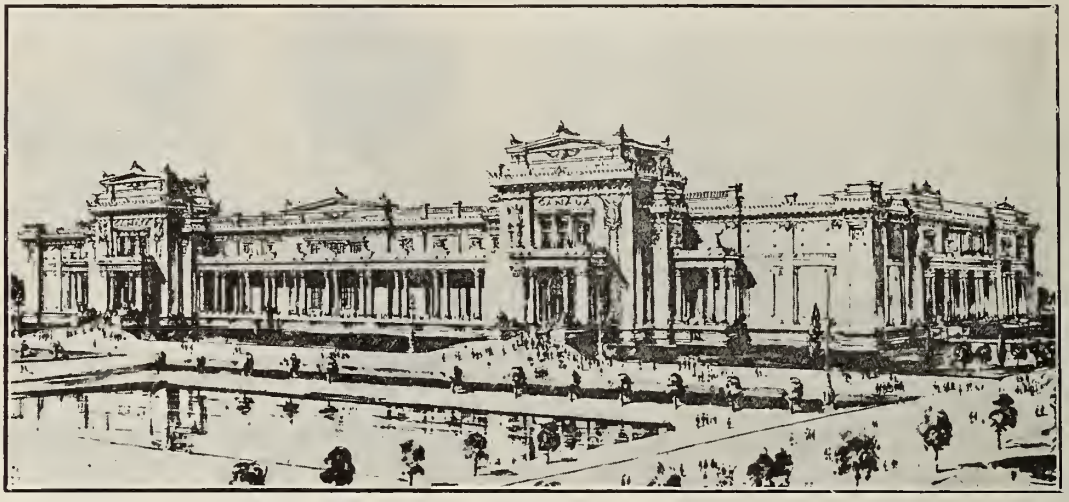
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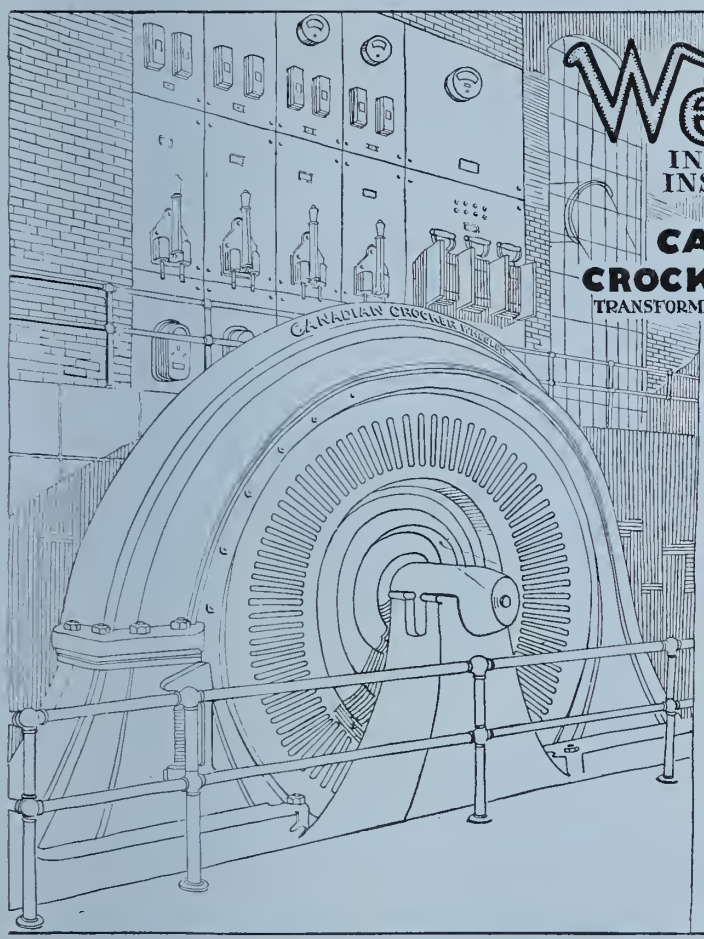
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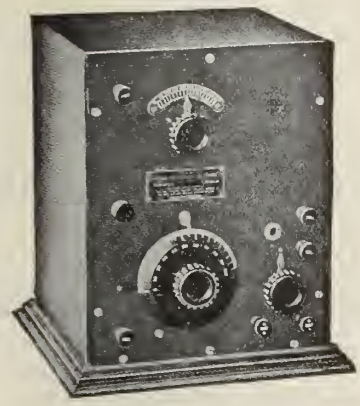
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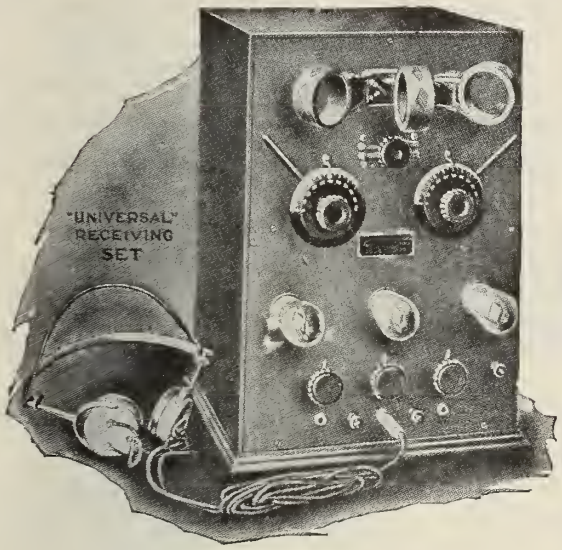
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Toronto, Canada

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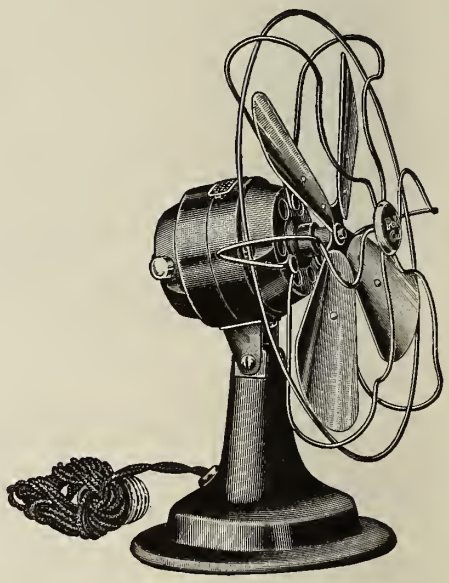
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To Jobbers

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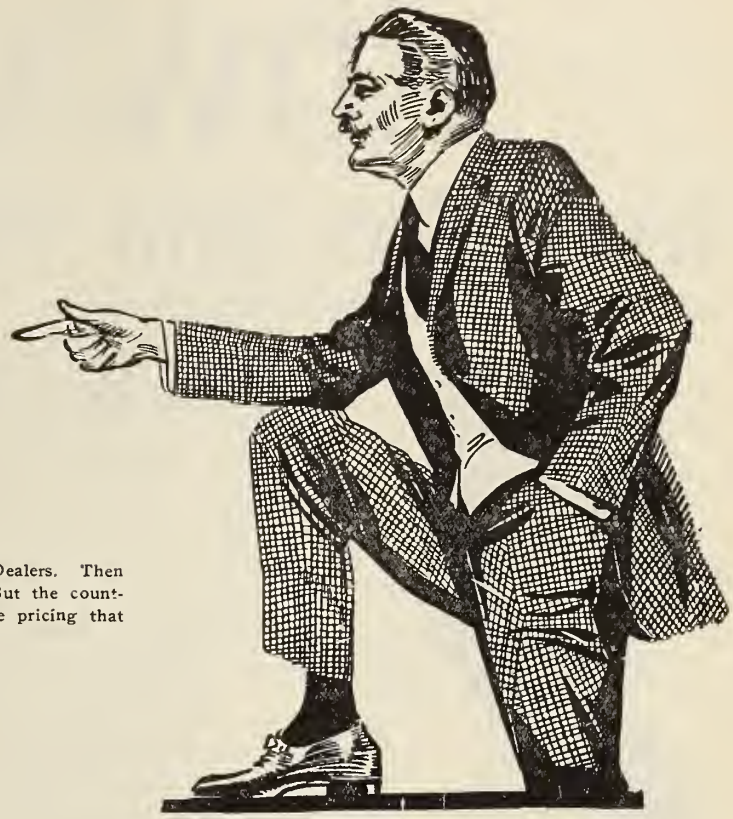
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Midnight Dec. 31, 1923



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Price Your Stock in One Night

Following requests from many of the trade we are this year printing a complete list of Cost Prices on all standard electrical materials to enable the dealer to price his stock quickly without the necessity of searching through invoices, looking up catalogs, taking off discounts or procuring prices from wholesalers.

Costs Only $4.75

This list is entirely separate from our regular price service and is issued for the purpose of inventory only. The prices will be cost plus sales tax effective on Dec 31, 1923. No book or change sheets will be included. The list will be supplied only to those engaged in the Electrical business.

Order To-day

Only a certain number of these lists will be printed so as not to interfere with our regular office routine. It is not a money making proposition with us but rather an advertisement for our regular cost and Retail service. We expect to be swamped with orders on account of the low price of $4.75. Every Dealer, Hydro Shop, Power Company and Jobber in the Country will likely order it so we suggest you tear off this coupon, attach your check and mail it to us at once. Orders filled in order of arrival and no orders filled after January 10, 1924.

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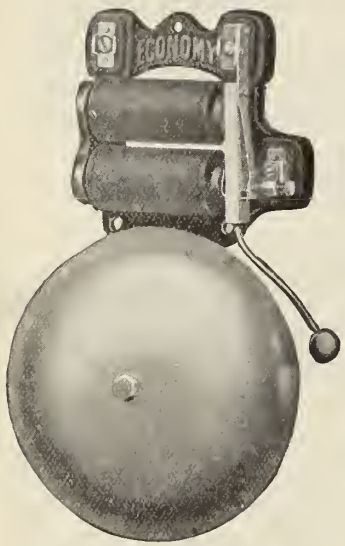
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They are sold by 99% of the reputable Jobbing Houses.

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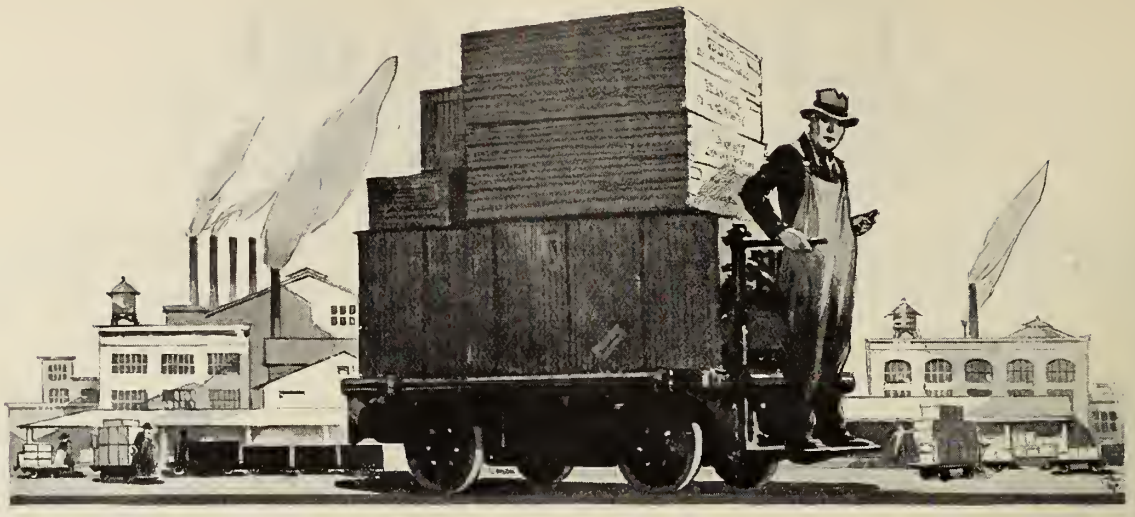
Member Business Newspapers Association of Canada

Vol. 32 December 15, 1923 No. 24

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Electric industrial trucks and tractors have reduced material-handling expense to astonishingly low levels in hundreds of plants and factories.

You ought to read these facts and figures in the booklets supplied by the manufacturers of this equipment. We will be glad to help by supplying you with a list of truck and tractor makers. Write today for Form 160 R.

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ELECTRICAL NEWS

DEVOTED TO THE INTERESTS OF
A UNIFIED ELECTRICAL INDUSTRY

Vol. 32 Toronto, December 15, 1923 No. 24

Makes Real Success of Merchandising

Good Location and Careful Attention to Windows Bring Many Sales to H. W. Chadwick's Store—Big Line of Novelty Goods Draws Customers and Adds Color to Electrical Displays—No Effort to Get Wiring Business

DOES the retail electrical business offer a profitable field for a young man at the present time? A satisfactory answer to the question is furnished by the experience of Harold W. Chadwick, of Hamilton, Ont. Though one of the youngest store managers in the business, he has made a substantial success by the simple process of applying methods that have proved successful in other lines.

The excellent location of the Chadwick store is a prime factor in the success of the business. King Street, East, is one of the best retail streets in Hamilton, and the business carried on by Mr. Chadwick is quite in keeping with the reputation of the street. We can't say that before establishing in the site he stood on the sidewalk and counted the passersby so as to find out how much potential business there was, but it is certain that he knew he was going to a busy street, and that all the passersby were customers who would eventually come to him.



At left, H. W. Chadwick, one of the youngest successful store managers in the business, in the interior of his store at Hamilton

Our readers will naturally assume that under the circumstances, there is a good deal of attention given to window displays—and the assumption is correct. Mr. Chadwick believes that the show window is one of his best salesman, and on the principle of not killing the goose that lays the golden eggs, he does not neglect it. The displays are changed regularly, and what is more, thoughtfully. Full attention is paid to seasonal opportunities, such as Christmas, Easter, June Bride, Thanksgiving, and so on, and he uses one or more appropriate trims for each of these occasions.

This fall, for example, he had one window in which electric heaters were brought to the notice of the public. Then he featured portable lamps, with an attention drawing trim that included various novelties such as book ends, statuettes, art pottery, and candle sticks. At the moment he is using displays that draw the notice of the public to electrical goods as Christmas gifts.

Some idea of the interior arrangement may be obtained from the accompanying photograph. Similar lines are grouped together as much as possible, but the whole layout of the store is based on the fact that electrical goods must be given an attractive setting. Art goods of various kinds are displayed on shelves and counters, and there is not the least suggestion of a "warehousy" effect.

Mr. Chadwick believes firmly in the opportunities presented by the merchandising end of the electrical business, as distinct from contracting. He does not go after wiring, but of course some naturally comes to him, and when it does he turns it over to a contractor with whom he has a working arrangement.

It is but fair to state that Mr. Chadwick has had the advantage of an early training under a man who has been in the business all his life. That is his father C. W. Chadwick, who is running a jobbing business in Hamilton. Another retail electrical store, the Popular Priced Electricians, on the same street, is also owned by the Chadwick family. Both father and son are enthusiastic about the electrical business, which is half the battle.



A recent window in the store of H. W. Chadwick, Hamilon, Ont. Pottery and other novelties are extensively displayed, lending color to electrical goods

Letter to the Editor

Editor, Electrical News:

Electrical dealers are now almost universally aware of the fact that the percentage of mark-up should be calculated on the selling price, but they fall down when it comes to the practical application of this rule, because they are afraid of the figuring involved. I know you have printed articles on this, will you please repeat briefly.

Yours truly

J— B—.

An easy way of figuring this mark-up correctly, is given in the accompanying table. It gives unit costs, and by this arrangement it can be used for any cost price.

% profit on selling price required	Multipler
20	1.25
25	1.35
30	1.43
35	1.54
40	1.67
45	1.82
50	2.00

Suppose you had an article that cost $1.50, and you wanted to have a 40 per cent profit on the selling price. The table gives the multiplier as 1.67. Take the original cost, $1.50, and multiply by 1.67. The calculation looks like this:

$$1.50 \times 1.67 = 2.505$$

and as the last figure is negligible (beng only half a cent), we strike it off and arrive at a selling price of $2.50.

This process can be used for any cost price. The only thinking required in the whole process is involved in placing the decimal correctly.

Toronto Contractor-Dealers Meet

Discussion on the prices of range wiring featured the December meeting of the Toronto electrical contractors and dealers. Actual figures were brought out for certain cases and it was finally proved that some members were not making money on this work.

Election of officers for the coming year was carried out. Messrs. Cheevers, Clark, Davenport, Moss, Newman and Stacey were made members of the executive. This executive board will later appoint a chairman for the district.

Why Did the Manitoba Power Co. Explode 56,000 lbs. Dynamite?

On October 15, the Manitoba Power Company fired 56,000 lbs. of dynamite and cleared away 24,000 cu. yds. of cofferdam. Read the fascinating story of why they did this, on page 56 of the present issue.

How to Handle Electric Motors and Generators—II

Second Article of a Series Giving Complete Instruction on Installation and Maintenance of Electric Motors and Generators†

In order to permit satisfactory operation, the location of machines should be arranged to meet the following conditions:

1. Protection from moisture, escaping steam, dripping pipes, oil, acid, alkali, chlorine or other gases.

2. Protection from dust, dirt, lint or any other injurious substances.

3. Good ventilation and accessibility for cleaning and inspection with respect to the surrounding equipment.

Motors should not be exposed to excessively high surrounding air temperatures, that is, where the ultimate temperature of the windings will be over 90 degrees C.

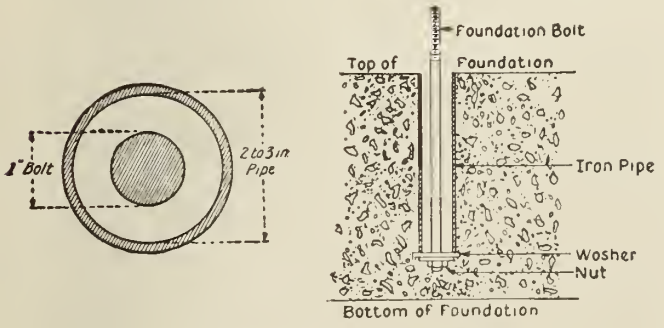
4. Sufficient floor space for a belted exciter is used.

*Foundation

Contracts for the purchase of electric motors and generators usually make the purchaser responsible for furnishing such foundations as may be required, and, in the absence of contract provisions, the following general information may be of value.

Foundations are generally made of concrete. The usual concrete mixture consists of one part cement, three parts clean, sharp sand and six parts crushed stone or gravel. This is sometimes expressed as 1:3:6. However, for quick work where quick setting is required, a 1:2:4 mixture can be used. Brick or stone can be set in a mortar consisting of one part cement and three parts sand. These foundations should be allowed to set at least two or three weeks before the machine is placd on them.

The size of a foundation is determined by the size



Figs. 1 and 2—Method of locating foundation bolts

of the machine and by the stress imposed by the machine. Any foundation must have sufficient area at its base to support its own weight and the weight of the machines. Some experience is necessary to design as light a foundation as will do, so it is better practice to make foundations with a generous factor of safety. Clean, sharp sand is considered to be a good bearing soil and the bearing power of different soils is given in the following table:

Bearing Power of Soils

Soil	Tons Per Sq. Ft.	Authority
Good solid natural earth ...	4	N. Y. Building Laws
Pure clay, 15 ft. thick, no admixtures of fereign substances except gravel .. .	1.75	Chicago Bldg. Ordinance
Dry sand, 15 ft. thick, no admixtures of foreign substances	2	Chicago Bldg. Ordinance
Clay and sand mixed	1.5	Chicago Bldg. Ordinance
Hard rock on native bed ...	2.5	Richey
Ledge rock	36.	Richey
Hard pan	8	Richey
Gravel	5	Richey
Clean clay	4	Richey
Dry clay	3	Richey
Wet sand	2	Richey
Loam	1	Richey

No general rule can be given for the proper weight of a foundation, but usually if the foundation is large enough to include all of the foundation bolts of the machine and extend to a good bottom, it will be sufficiently heavy for the purpose.

In most applications of large machines, the hollowed-out type of foundation is required. The position of the holding down bolts is shown on the outline drawings of the machine and a template should be used for laying out the location of all the foundation bolts. In order to permit a slight variation in the position of these bolts they should be located in iron pipes which an inside diameter at least 1 inch larger and preferably 2 inches larger than the diameter of the bolts. (See Fig. 1). When the machine is in its exact location, the iron pipes should be filled with concrete or grout to the top of the foundation. (See Fig. 2).

Bolts can also be cast in solid and foundation washers can be used on the lower ends of the bolts to secure them in the foundation. Ordinary round building washers, pieces of steel plate with holes punched through their centres, pieces of angle iron, etc., are sometimes used but standard foundation washers are better as they are designed to prevent the nut from turning on the bolt. With large machines, it is desirable to have pockets in the concrete large enough to take the plates. The foundation bolts and plates can be hung in the holes and the

*This information is particularly applicable to large machines. For small machines, wood or iron frame work is usually used but unless substantial ironwork or heavy seasoned timbers are used, the machines are liable to get out of alignment and vibrate.

†From information supplied by Electric Power Club.

bolts filled when grouting the base. This insures a good bond between the foundation and the grout, in and under the base, and the proper setting of the foundation bolts.

Good grout is a mixture consisting of one-half clean, sharp sand and one-half cement. It should be made thin enough to flow readily. Before pouring the grout all dust and dirt should be cleaned off and the foundation wet down thoroughly. It is advisable to use a slow setting cement with large castings, otherwise the temperature rise of the setting grout may cause distortion of the casting. Old cement sets slower than new.

Where assembled machines are mounted on bases, the base should be carefully leveled before being grouted in. An average distance of 1 inch should be allowed between the top of the foundation and the bottom of the base for grouting. If this distance is too large, there is a chance of the grouting shrinking away from the base.

To grout the base, build a low dam around the inside and outside and float in the grout mixture to a height of one-quarter inch above the lower face of the base. If the grouting is too deep, it will make it difficult to subsequently remove the base if desired.

Bases of machines shipped disassembled should be also grouted in but the grout must be given sufficient time to "set hard" before the stators and pillow blocks are put in place. This should be done under the supervision of an expert on the lining up of machinery.

Motor and generator bases are not supposed to carry any weight when unevenly supported. To prevent distortion, therefore, they should be carefully leveled by means of leveling wedges and grouted before any weight is placed on them.



How electrical contractors can use rock drills to advantage. Left—Drilling anchor bolt holes in concrete floor with an "Industrial Jackhamer." Very high drilling speeds are made on this class of work. Right—An ordinary pneumatic chipper with a flat chisel is sometimes used for drilling through brick or concrete

O. S. Leyes Makes Fine Start in "Good Housekeeping Shop"

Women are vitally interested in all matters that pertain to housekeeping. If they can see an electric store as a place where they can find out things about housekeeping, they are likely to visit it.

With that fact in mind, O. S. Leyes, of Kitchener, Ont., has entered the electrical selling field. He has started with the idea of stressing the "electrical housekeeping" idea, of impressing housewives with the benefits to be derived from the use of electrical appliances. He advertises his store as the "Good Housekeeping Shop," and endeavors to make it live up to the name. Mr. Leyes states that prompt service and home demonstration are two other features of the way he intends to build up business.

Erection

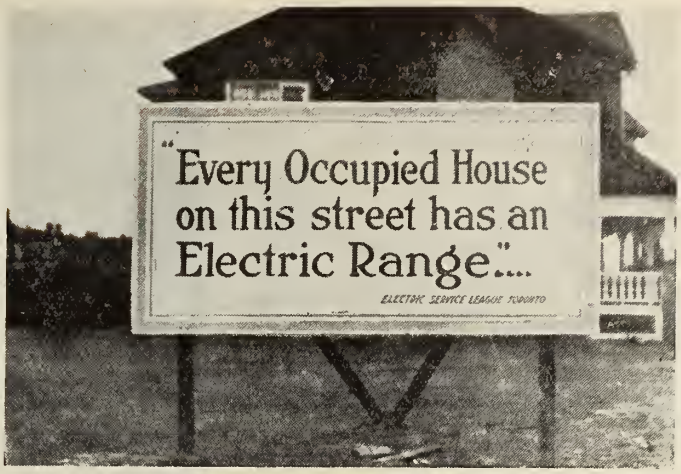
Machines must be lined up on their foundations, so that the driving and driven shafts are parallel. Driving and drived pulleys must be in line so that the belt will run true. Driving pinions and their gears must mesh accurately. If the machines are direct connected the shafts must be in line. Full assurance that the pulleys are properly aligned can be obtained by temporarily installing the belt and turning the pulleys by hand where this is possible. After the machines have been accurately aligned, the slide rails, bed plate, or the machine itself (as the case may be) must be bolted rigidly to the foundations.

Wall and Ceiling Mounting

Motors or generators intended for floor, wall or ceiling mounting have end shields or bearing housings which can be turned through 90 or 180 degrees. Machines are shipped for floor mounting unless otherwise specified. For wall or ceiling mounting, the end shields or bearing housing must first be turned through the corresponding angle and the connections rearranged as per diagram or instructions furnished by the manufacturer. Some machines with brushes may require special brush holders when mounted on the wall. It is preferable that adjustments for ceiling or side wall suspension be made before the machine is shipped and the manufacturer should be advised accordingly when the machine is ordered.

Whenever the end shields are removed care must be exercised to see that the surfaces of the joints are perfectly clean before the end shields are replaced and the bolts tightened, otherwise the alignment may be so affected that the bearings will heat unduly.

There is no catch about this sign and its claim



39 electric ranges are used in homes on that street.

40 Christmas Windows in Toronto

Results from Electric Service League Work

Latest reports on the Christmas Campaign of the Electric Service League, Toronto, show that the schedule is working out perfectly. Over 40 windows are being used for the display of electrical Christmas gifts in accordance with the free window dressing plan of the League. An important part of the work has been the securing of two electrical pages in the daily press, the first of which appeared on December 12, a fair percentage of the space being allowed, gratis, for educational propaganda.

The Red Seal folders were sent to 130 builders in October. The League is now working on a list of 400 builders and 150 architects. A Red Seal house picture, showing a number of homes with the Red Seal placard, is being sent to each of these, and to the builders as well is being sent a reproduction of the picture which is used at the head of this article. This latter will drive home to the builders the rapid extension in the number of electric ranges being used and the need of proper wiring for this purpose. The manager of the League, Mr. G. W. Austen, has outlined a tentative program for 1924, which appears to be full of promise. Such matters as an Electric Home, Bride Gift Campaign, Store Lighting, Christmas Campaign, etc., are sure of good attention. The actual condition of the street referred to in the above picture is that thirty-nine homes are occupied and using electric ranges. The only unoccupied homes are two or three building, but not yet completed.

A Splendid International Convention

Dealers and Contractors Came in Large Numbers — Instructive Addresses on all Phases of Electrical Business

Everything went off with a bang, so to speak, at the one-day convention of the Association of Electragists, International, which was held in Toronto on November 26. Attendance was not by any means restricted to the membership, in fact, there were men present who didn't know what the name of the association was. At any rate a large number of bona fide dealers and contractors showed up, and several brought their wives.

Miss Alice Carroll, of the Society for Electrical Development, opened the program in the afternoon with an interesting talk that dealt in a general way with the merchandising of appliances. She had visited several electrical stores in the morning, and consequently was able to give her audience an "inside" viewpoint of the way in which women customers regard the various Toronto electrical stores. Among other points she brought out was the fact that in many cases the wives of the dealers are left in charge, while the "boss" is out doing wiring jobs. According to her, that is the right idea, as women can sell other women from the woman's point of view. Miss Carroll said that electrical goods must be entirely and completely sold, that there were few electrical housekeeping shops in Toronto, that at least three or four fancy portable lamps should be stocked to keep the interior of the store attractive, and that dealers would find greater satisfaction in specializing in one or two lines.

Laurence W. Davis was the next speaker, and he very forcibly brought out the idea that overhead was an unescapable accessory in every business. It

was his firm conviction that a combined contractor-dealer business is the right thing (even if there is a loss on merchandising) because it stamps on the mind of the public that the contractor-dealer is an electrical man, that his place is headquarters for things electrical. Mr. Davis also gave an interesting illustration of the use of the Manual of Estimating.

In the evening the attendance at the dinner showed an increase over the afternoon. The dining room of the Prince George was filled, and the crowd was not by any means local, dealers and contractors from all the nearby towns and cities being present. Dinner started promptly, and that important part of the program, disposed of, the assembled crowd leaned back and listened to an interesting address by James R. Strong, president of the association, who was introduced by R. A. L. Gray, in a graceful and humorous speech.

Mr. Strong told the gathering of the purposes and ideals of the association, of the working of the Eidlitz plan, and of the fact that everybody, including the manufacturers, was investigating the subject of margins on electrical goods. He claimed that the Manual of Estimating was a book well worth studying. He gave some interesting details as to the interior working of the association, stating that a staff of 20 were kept busy as bees in New York. In concluding his address, Mr. Strong made an eloquent appeal, urging each man to devote at least five hours a week to the study of his own business.

After Mr. Strong's speech, the lucky ones who had brought their wives or lady friends, ended the evening with a dance. They were not the only ones, however, who declared that the entire affair was a most successful convention.

Business Notes

The H. & W. Nadio Co. has been registered in Montreal, Que.

Allright Electric Co. has been registered at 100 Adelaide Street, East, Toronto, Ont.

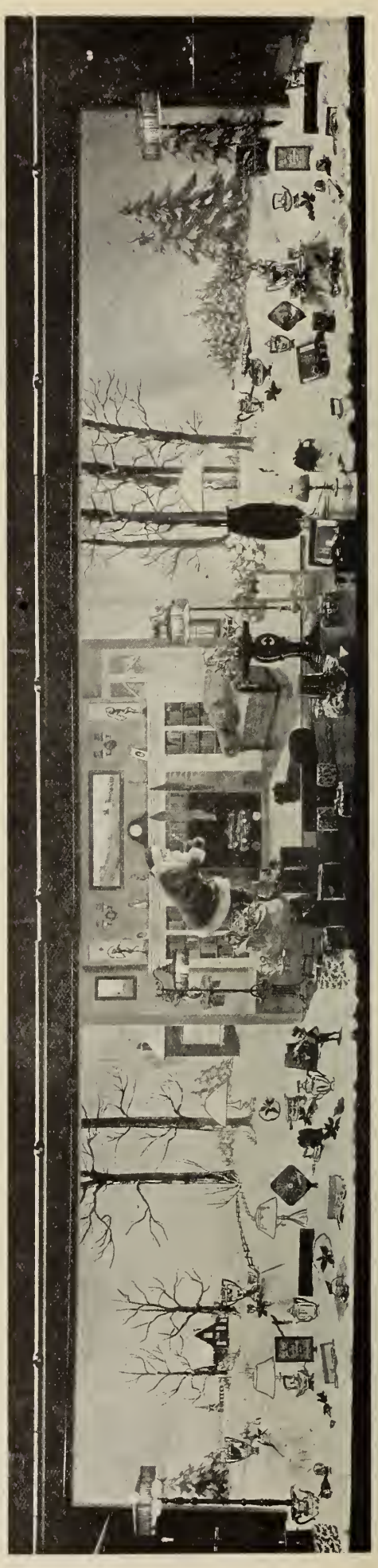
Baldwin International Radio of Canada, Ltd., has obtained a charter. Capital is $40,000, head office, Toronto, Ont.

B. W. Moncur Electric Co. has been registered in Montreal, Que.

Shirley & Wilbur Johnstone are successors to the Kingsville Electric Supply Co., Kingsville, Ont.

Send a photograph of your Christmas window display to Electrical News.

Monster Window For Extensive Display of Electrical Christmas Gifts



The striking display pictured in our photograph, was recently arranged in the show windows of the Canadian General Electric Company, King St. West, Toronto. Three separate photos were taken, and joined up to make a composite view, as shown. The background was painted much after the fashion of stage scenery, the two ends representing outdoor winter scenes, and the centre a cosy living room on Christmas Eve with Santa Claus distributing electrical Christmas gifts.

A Woman's Viewpoint on Selling Electric Washers

"Inside" Tips that Help to Sell More Machines

A woman's viewpoint on the selling of electric washing machines is interestingly presented by Ada Bessie Swann, in Contact. It contains many valuable suggestions for the electrical man who wants to sell washers:

"Can't afford it," is the first thing that is said against the installation of electrical equipment. Equipment for offices is placed because it saves time, money and energy but when it comes to the home, labor savers are grudgingly installed just because makeshifts have been the rule for so long.

It is often hard to prove to the husband that the electric washer and ironer are savers of money. But this can be accomplished when the facts are presented.

Convincing the Husband

Figure a woman's laundress or laundry bills each week and you can prove that in less than a year she could purchase and pay for the best washing machine on the market. This mechanical servant never tires or grumbles or disappoints, either. It does just as his wife desires when she so desires. Equipped with a swinging wringer, the first load of clothes can be put through the rinse water while the second load is being washed. In one hour and a half the entire wash for a family of seven can be completed and out on the line—the old time drudgery of "blue Monday" turned into play.

Expecting the Impossible

Women often expect the impossible from electrical equipment and no device will do the impossible. Perhaps they are led astray by the fairy-like statements we read in many of the advertisements, such as "Press the button and the snowy white clothes are ready for the line."

Why Push Electric Washers in Winter Months?

First—scores of women will receive gifts of money for Christmas. How could they spend that money to better personal advantage than by investing it in something that will add to their enjoyment the year 'round?

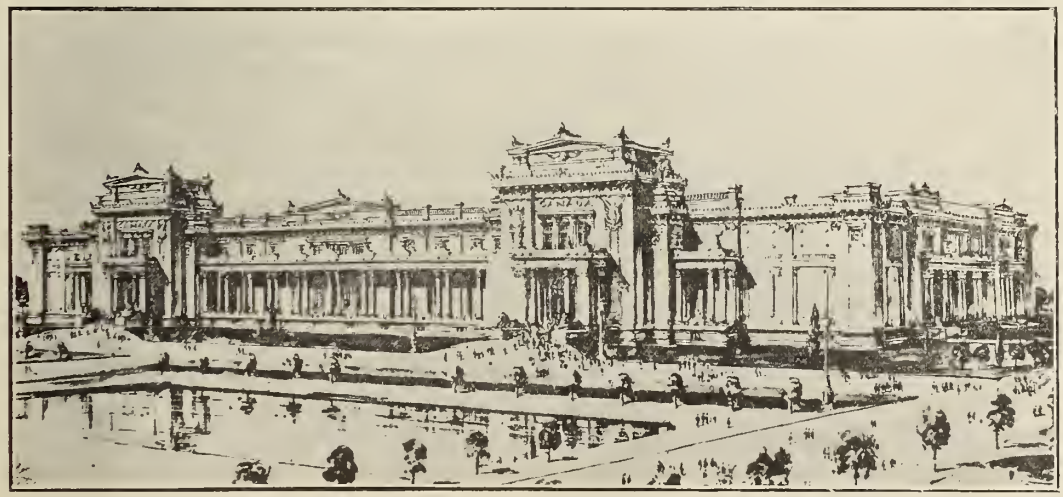
Second—homes are frequently dustier in winter than in summer. Furnaces and stoves are going twenty-four hours a day, circulating dust and soot, and depositing it everywhere in the house. This means more washing.

Third—women give more time to homekeeping in winter than in summer. The average woman is more or less "cooped up." Weather doesn't permit her going out so much. She spends more time indoors, and has more time, and more inclination for listening to the facts about how she can accomplish more in keeping her clothes clean, in less time, with less effort, less expense, and more satisfaction.

Mrs. Abbey bought a washer from Mr. Frank, the electric dealer in her town. It was delivered and a demonstrator showed her just how to use the machine. Mrs. Abbey was sure she understood and on the following Monday prepared to do her washing. She put in the clothes, turned on the switch and the machine, of course, operated beautifully.

At 12.30 Mr. Frank was asked over the 'phone to stop at the house. There was something wrong with her machine. The dealer when he come, went to the basement, examined the washer which was still in operation and said, "Why your machine is all right, its working perfectly."

"It's running all right," said Mrs. Abbey. "The blessed thing has been running like that all morning and the clothes haven't come through the wringer yet."



How the Canadian Pavilion will look at the Empire Exhibition, to be held in Wembly, England, next year. The Dalyte Electric, Limited, Guelph, Ont., are furnishing all the electric bulbs to be used in this building, comprising over 3000 tungsten lamps and some 2000 gas filled lamps, ranging from 100 to 300 watts.



E. B. Myers

Making Radio Tubes in Canadian Factory

A Non-technical Description of the Processes of a New Industry—Manufacture Involves Assemblage of Large Number of Small Parts—Intricate Machines and Skilled Workers are Essential Accessories to Production

Wireless would still be merely an idea hovering uncertainly on the verge of the marvellous were it not for the invention of the radio vacuum tube. This little instrument of glass and filament, seemingly so simple in its construction and design, so insignificent in its proportions, gave to wireless the power that has made it a commercial success and a means of entertainment to millions the world-over.

So much we gleaned from Mr. E. B. Myers, the inventor of the Myers vacuum tube, and Samuel I. Levy the president of the company. Mr. Myers showed us over the Montreal factory of which he is the technical chief.

All one's preconceived notions of a factory must be revised when one enters the home of the Myers Tube. It is more like a laboratory than a factory and the first-glance impression makes one aware that here is a scientific process rather than the mechanical production of a patterned article.

From the manager's office one looks through a wide-meshed wire screen over a large room which is splashed here and there with pools of brilliant light flooding the work benches. The hum of electric motors sounds like the droning of countless bees and the white-coated male and female operators are startlingly prominent in the glare from the low hanging, high-power lamps. Jets of blue gas flame and the red glow of hot glass show up here and there and as one becomes accustomed to the motor's hum the absence of other noises invades one's consciousness.

Here are deft-fingered girls welding together tiny pieces of wire the composition of which is a secret. With uncanny swiftness they pick up the small pieces with forceps from the glittering piles, insert them between the jaws of the electric welders and in a twinkling the operation is complete.

These little welded fragments are then carefully placed in cages, which, as they are filled, are passed on to a chemical bath that cleanses them of any particles of foreign matter which would impair their efficiency.

The insertion of the filament wire in the fine spiral grid is the next operation that claims attention. This filament is less in diameter than the finest hair, yet possesses a durability that is beyond belief. It is worked with infinite patience into position and then becomes part of the intricate mesh of leads that clarify the wireless sounds that are caught by your radio out of illimitable space.

Spurting jets of blue gas flame attract us to the next operation where glass cleats are being melted on to both ends of the leads. Sticks of glass are held by the operators to the terrific melting power of the gas flames and the glass runs in globules around the leads insulating them while holding them firmly together. The sensitive nerves of the tubes are now complete and after the usual chemical cleansing are ready to be inserted and sealed in their glass tubes.

Tube Making

The work is extremely fascinating as much because of the skill and quickness of the workers as because of the wonderful accuracy of the machines employed. Hissing jets of flame play upon tubular glass which is turned by the operators so that the melting glass takes care of a dozen tube cases at a time, but the operator must know exactly when the glass has reached the right melting stage and change over the tubes to the unfinished ends. A hollow glass tube is melted on to the side of the tubes at this stage so that when they are moved on to the vacuum machines every trace of gas can be extracted from them and they can be finally sealed and passed as gas free.

Now the tubes are ready for capping and then their final tests in actual radio reception. To the radio enthusiast this last operation would prove the most interesting. The tubes are mounted on various kinds of sets and tested with varying voltages for radio frequency amplification. The tests are severe, running the whole gamut of the scale of perfection and they must show absolute freedom from tube hiss or mechanical noise as well as high power of amplification.

Made Radio Installation on Train

Successful Experiment Promises Much

The marvellous extent to which radio is permeating every side and complexion of our modern life is every day being illustrated in diverse applications. The installation which was recently made on a C.P.R. train is a typical example. It is true that such things have been done before but this particular case is distinguished by the remarkably quick time in which the installation was made and by the excellence of results secured.

The date was the 11th of October, just when Lloyd George was passing through Ontario. An order came to the Canadian Independent Telephone Company and at 5.30 that afternoon a radio engineer boarded the C. P. R. car "Newcastle" at the Union Station. In a momonet he and his assistant were at work stringing the antenna, a one wire No. 10 stranded insulated copper. It was suspended 7 inches above roof and led in through the ventilator to the smoking room. A ground was made on the steam pipes and the little SC-10 receiver, with the addition of a two-stage audio amplifier was ready for action.

At 6.15 p.m. (just three quarters of an hour afterwards) clear reception was obtained. The head phones were laid on the table and spectators in the corridor of the smoking room heard music that was being played in Pittsburgh. A slight adjustment and distant performers in Buffalo had extended their audience to that corridor of the railway car in the Toronto Union Station.

Unquestionably the efficiency of the receiver had been proved for the condition of the train remaining stationary. Further confirmations were obtained with no trouble. Chicago, New York, Schenectady, Buffalo, Springfield, and others more distant were picked up right inside the Union depot with no interference at all from the local broadcasting station.

The final test was in regard to the reception while the train was moving. The train started and the engineer in charge of the installation gave the little set a final farewell as the train puffed along to West Toronto Junction. Kansas City came in on a Magnavox clear and distinct, and there was no interference except for a slight click as the train passed on a bridge over the trolley wires.

The whole experiment was entirely successful, leading to the belief that at some time in the future, radio apparatus will be a standard part of the equipment on all passenger trains.



Is Your Stock Ready For That Last Minute Rush?

Celoron Panels for Christmas Gifts

For the fan who is building or is about to build his own radio set a radio panel makes a good Christmas present.

The radio panel being the base upon which a set is built should have certain definite properties. It should be good-looking, for it is the front door of the set.

The radio panel should have high dielectric strength to prevent the escape of electric current. If it is a poor insulator, the effectiveness of the best instruments can be reduced by leakage of current and by the effects of body capacity.



Radio fans in Canada and the United States are finding that Celoron Standard Radio Panels, manufactured by the Diamond State Fibre Company, have all the peculiar properties necessary for radio work.

Celoron, a bakelite product, is smooth, strong, hard and waterproof. A shiny, lustrous black in color it adds tremendously to the attractive appearance of any radio set. A dull mat finish can easily be obtained, if desired, by rubbing down with sandpaper. Besides the black Celoron there are also Celoron panels finished in mahogany and oak. Celoron has been approved by the U. S. Navy and U. S. Signal Corps.

Up to about a year ago the radio fan had to wait while the dealer cut the desired size of panel from sheet stock. Now the set builder can ask for any of the standard Celoron panel sizes and get immediately a panel, already cut and wrapped in a glassine envelope to protect its surface from scratches.

The standard sizes of Celoron panels are: 6 x 7, 7 x 9, 7 x 12, 7 x 14, 7 x 18, 7 x 21, 7 x 24, 7 x 26, 9 x 14, 12 x 14, 12 x 18. Thicknesses are 1/8", 3/16" or 1/4".

These sizes are designed to meet all the ordinary needs of the set builder. Other sizes, however, can easily be furnished for special hook-ups.

Prominent Electrical Contractor Dealers

—15—

G. W. Moss, Toronto

An experience of over 20 years in various lines of the electrical business has made Gordon W. Moss a well-known figure in Toronto electrical circles. His recent successful activities in connection with the Licensing By-law have still further added to the esteem in which he is held.

Mr. Moss' first experience was gained in the local offices of the Canadian General Electric Company, many years ago, where he learned the fundamentals



Gordon W. Moss

of the game. The intervening time has been full of varied activities, all of them rich with experience, if nothing else. He was on the road for several years, selling Holophane and other things. For some time he was a manufacturers' agent on his own account.

The contracting side of the electrical business first attracted Mr. Moss about ten years ago, and he has been engaged in that line of activity ever since. During the last four years he has been carrying on in company with Mr. D. R. Stocks, another well-known figure among Toronto electrical men, under the firm name of Moss & Stocks.

A noteworthy feature of Mr. Moss' career has been the attention he has given to association work. Always ready to help any movement for the good of the trade in general, he went whole-heartedly into the movement to obtain a licensing by-law for Toronto, and the successful completion of this project is due in no small measure to his personal effort.

The White Coal Heater Co., W. H. Warrington, manager, have opened for business at 1220 Dundas St., W., Toronto, Ont. They are marketing an electric house-heating boiler.

Ranges Sell Themselves in Kitchener

Not so many months ago the city of Kitchener, Ont., had less than fifty electric ranges. Today there are five hundred installed. This may not seem a very large total for a population of 22,000 but the point is that this big increase has taken place without any special effort.

This city is cited merely as an example of the ease with which electric ranges are being placed today. Mr. V. S. McIntyre, the manager of the Kitchener Hydro-electric System, assures us that there has been no special campaign to sell electric ranges. He gives two reasons for this: first, being an industrial city, the cooking load maximum demand coincides with the industrial demand, making a troublesome peak around eleven o'clock a.m. and, second, he is also superintendent of the gas department which must earn revenue on its half million expenditure. His policy necessarily must be to advocate impartially the use of both gas and electricity for cooking.

The question naturally arises:—how many ranges could have been sold by an active campaign?

This story emphasizes the attitude of the general public toward electric ranges. There is no reason why Kitchener should be different from other cities. The inference is, then, that the range harvest is ripe. This specific case ought to convince the electrical dealer that sufficient "peppo" will guarantee him a goodly number of sales; and range sales mean wiring jobs; and both mean profits, if the prices are right.

Wilson Illumination Open Show Rooms

Wilson Illumination Company have opened show rooms at 237½ Yonge St., Toronto, Ont. This firm is representing the Pittsburgh Lamp, Brass & Glass Company of Canada, Limited, the J. H. Edmunds Company, Limited, and the Art Novelty Studios. Mr. D. Wilson reports that business prospects are very promising indeed.

A Curious Service Request

Many service requests have curious stories connected with them but E. V. Buchanan, general manager, Public Utilities Commission, London, Ont., has produced one that beats them all. He has received a letter from a woman in Glasgow, Scotland, asking how to run an electric range. Apparently she had just purchased it, but was not sure as to the method of operation. Mr. Buchanan is, we understand, answering the letter, and no doubt his advice will result in the furnishing of surpassingly fine porridge and haggis to some canny Scotsman.

The Latest Developments in Electrical Equipment

Safety Cap Lamp

Concordia Electric Company has placed on the market an electric safety cap lamp designed for use in coal mines. The device consists of a single lead-acid cell, in which the negative plate is of oval or



elliptical shape and fits closely against the inside of the container while the positive plate is composed of two flat plates placed back to back with glass wool between them, the arrangement being placed in the centre of the negative plate. The electrolyte is a solidified sulphuric acid solution rendering the battery non-spillable. An outer casing of steel protects the celluloid battery jar.

Electric Surfacer

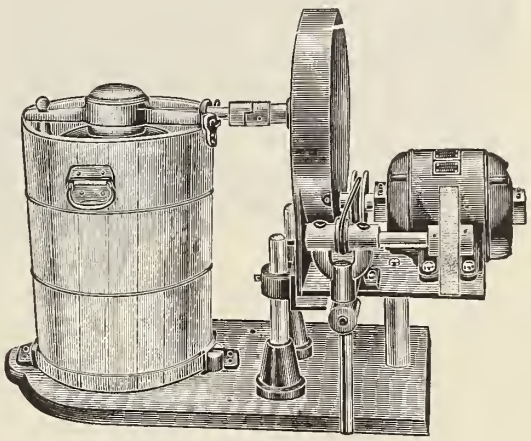
A new piece of equipment known as the electric surfacer, is coming into prominence in building operations. The device is shown in the accompanying



trically operated. Into the disc are set a number of blocks, generally four, of carborundum, making a illustration, and consists essentially of a disc electric wheel of approximately 14 in. in diameter. A few of these machines have already been sold in Canada and it is claimed for them that they make the surface of concrete as smooth as a billiard table. The photograph shows the machine being operated by two workmen.

Electric Freezer

The Alaska electrically driven freezer is said to combine in one device an ice cream freezer and power plant with which an emery wheel and other household appliances may be run. It may be operated from any electric light socket. The machine has an iron base, and the motor and gears are mounted on an iron unit, the whole unit being adjustable to the different sizes of freezers. The gears are covered. The bearing



for the large gear is separate from the frame and in case the bearing wears out, a new one can be put in. Freezer shaft is connected with the large gear by means of a clutch so that the freezer can be lifted out of place and put into position. The machine is equipped with self-induction type motor. Spur gear drive reduces the speed of the shaft to the desired speed for running the freezer.

Battery Carrier

American Chain Company are manufacturing a battery carrier designed to fit almost any type of battery. It is 16 inches over all, built of chain with

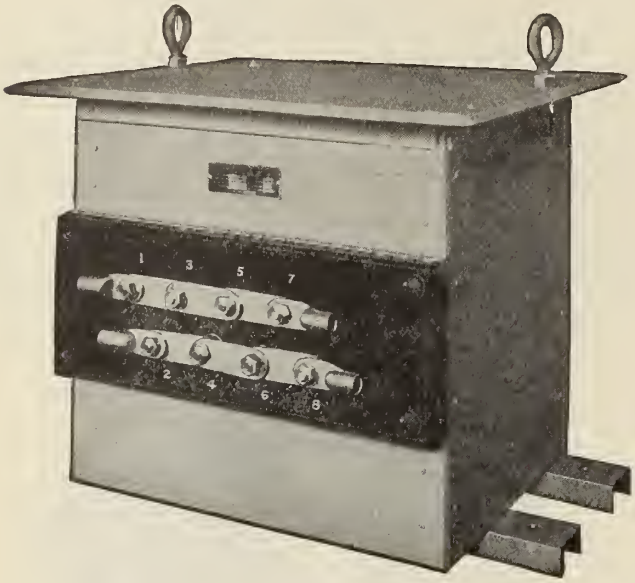


heavy hooks. The chain is covered with a woven cord shield, and galvanized ferrules protect the ends from acid. It is claimed that the device can be easily

hooked on to a battery even when the latter is low in the car.

Pipe Thawing Transformer

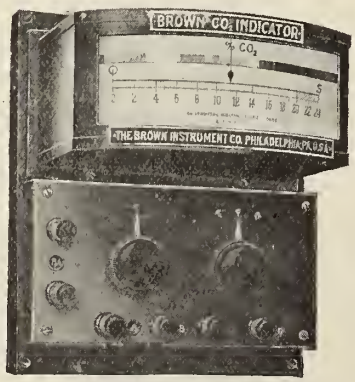
The cut shows a special form of transformer manufactured by the Ferranti Meter and Transformer



Mfg. Co., 26 Noble St., Toronto. This transformer is especially designed for the work of pipe thawing, and has been so constructed as to be suitable for mounting on vehicles.

Electrical Co_2 Meter

Brown Instrument Company are marketing an electrical CO_2 indicator which is claimed to do away with the troubles inherent to chemical recorders. The device uses the Wheatstone bridge principle, comparing the thermal conductivity of the gas under test with that of another gas adapted as the standard of comparison. The gas cells are used and one is filled with air and sealed for the comparison standard, the



other is exposed to a flow of the flue gas under test. Two small platinum spirals are mounted in the cell walls, and if the gases surrounding the two wires are alike in thermal conductivity, the cooling effects by conduction to the cell walls are equal.

32 Volt Charging Rheostat

To meet the requirements of farm light plant owners for a simple charging equipment for automobile and radio batteries, the Cutler-Hammer Mfg. Co. are offering a 32 volt, 5 ampere, charging rheostat. The

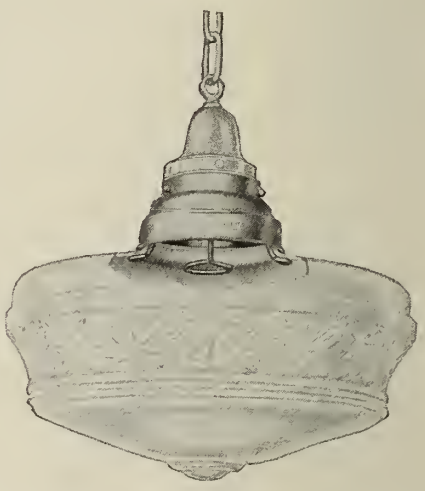


design is such that a wide range of charging combinations can be obtained. It is possible to charge, at one time, and at the rate of five amperes, a 3 cell, 6 volt battery, or a 6 cell, 12 volt battery or two 3 cell batteries, etc., up to 12 cells, 24 volts maximum. A dial plate, marked for the various numbers of cells and voltages is placed directly underneath the operating handle. It is then an easy matter to set this dial at the required marking and close the circuit.

The pointer must be opposite the marking on the dial that corresponds to the number of cells to be charged.

Adapta-Unit Globe Holder

A unit which is a metal globe holder that can be instantly attached to the shade holder of any one-



light ceiling fixture or pendant has been placed on the market by the Adapta Unit Company. A cased glass diffusing bowl is furnished with the unit. Three metal fingers support the bowl from the inside without clamping it, thus preventing breakage from expansion. A single lever projecting from the side of the unit operates all three of these supporting fingers.

Current News and Notes

Bagotville, Que.

The town of Bagotville, Chicoutimi county, intends to enter into the business of producing and selling electricity, according to a notice of private act to be presented by that Corporation. The town will seek powers to produce, transmit, distribute and sell electricity for industrial and domestic purposes outside of its territory in the whole township of Bagot, and especially to the municipalities of Port Alfred, Sainte Alexis and other points.

Chelsea Falls, Que.

Montreal Engineering Co., Ltd., 164 St. James St., Montreal, are receiving bids for the Riordon Co., Ltd., on a power house at Chelsea Falls, Que. Ultimate development will be 120,000 horsepower.

Chatham, Ont.

An installation of floodlights for the Chatham, Ont. armouries, is contemplated.

Cobalt, Ont.

March 1st is the date now set for the Castle-Trethewey to commence milling operations. The South Bay Power Co., with a two-year contract to supply power, is now busily engaged building a transmission line, putting in a second generator and raising the water level.

Fredericton, N. B.

Notice of incorporation of Carleton Electric Co. Ltd., an organization which has been formed to build a hydro line down the St. John river from a connection with the Maine & New Brunswick Power Company at Aroostook Falls to Woodstock, is contained in the Royal Gazette. The company will have an authorized capitalization of $99,000 with the head offices at Woodstock, and the incorporators are: Heber H. Hatfield, of Hartland; Wilmot F. Anderson, of Lakeville; Edgar R. Teed, of Woodstock; Charles F. Gallagher, of Bath; Hon. F. B. Carvell, of Ottawa.

Fort William, Ont.

On November 23, Fort William council consented to the Hydro commission entering into contracts with the Kaministiquia power company and other Fort William users, who desire to enter into contracts with them, and the use of such streets for that purpose as are outlined in a letter from W. L. Bird, of the Kaministiquia Power Company, Limited, to the city. The consent is to continue pending the time when the city has agreed to take power from the Hydro Commission. The route of the lines is to be selected by a representative of the commission, the city engineer and the manager of Fort William utilities.

Godbout, Que.

The Canadian Comstock Co., Ltd., have been awarded the contract for the hydro-electric development of the St. Regis Paper Co., at Gadbout, Que. This includes complete installation of hydraulic and electrical apparatus.

Halifax, N. S.

At the expiration of a year the Pictou County Power Board should have the right to take over the entire plant and equipment of the Pictou County Electric Company, Ltd., at a price to be determined by the board, by arbitration or expropriation, is the finding made by the Public Utilities Board of Nova Scotia at a recent meeting.

Hamilton, Ont.

On Nov. 21, W. F. McLaren and H. B. Dwight, addressed a large audience in the Westinghouse auditorium, Hamilton, Ont. Mr. McLaren explained the work of the draughting department, and Mr. Dwight described the duties of the engineer in design work.

Mildmay, Ont.

Mildmay Electric Company, Mildmay, Ont., contemplate improving their equipment, and are asking prices on transformers.

Niagara Falls, Ont.

Extensions to the illumination of the Horseshoe Falls are planned by the Queen Victoria park commission at a cost of $30,000. Tenders will be called for early in the spring. Two batteries of lights will be put in, one on the lodge near the Table Rock and the other on the roof of the Ontario Power house. The lighting ystem will also be extended to Dufferin Islands. All the works will be started and completed in the spring so that it will be ready for tourist business.

Oxford, N. S.

Edward Stewart & Duncan McKenzie, of French River, P. E. I., are engaged in building a dam for the Oxford Light & Power Co., near Oxford, N. S.

Ottawa, Ont.

It is roughly estimated that there are at least 50,000 radio receiving sets in use in Canada, representing an investment of about $2,500,000, and of that total only 16,118 have taken out licenses. In Toronto there are at least 10,000 sets in operation, and so far this year only 841 have taken out licenses, as compared with 918 last year. Over 1,100 have taken out licenses in Ottawa this year, while over 4,000 have been issued to Montreal users, as compared with 10,000 last year. Failure to take out a receiving license may invoke the penalty of the law, which is $50 on a summary conviction and $500 or one year's imprisonment on a conviction of indictment.

Quebec, Ont.

The section of the Quebec Power Company's line known as the Montmorency division, which connects this city with St. Anne deBeaupre and St. Joachim is now exclusively operated by electricity. The purchase of three powerful electric locomotives by the Quebec Power Company to be utilized on these lines in the place of steam engines has put an end to the use of steam on that section.

St. John, N. B.

A special discount for large users of power was agreed on at the meeting of the St. John, N. B. civic Power Commission on Nov 23, ranging from five to fifteen per cent, off the regular rates, according to the amount of current used.

Shawinigan Falls, Que.

The work of the power development at La Gabelle is progressing very satisfactorily. The concreting of the headgates and foundations for the units 3, 4 and 5 is well under way. A total of 140,000 yards of concrete have been placed to date. The Dominion Bridge Company have completed the installation of all the gates and an electric welder is now busy welding the gate joints.

St. Elizabeth, Que.

La Compagnie Electrique de Ste. Elizabeth, Limitee, has been incorporated with head office in St. Elizabeth, Que. Capital stock is $49,990,000. The company is licensed to transmit and generate electric power, and has various other privileges.

St. Paulin, Que.

J. M. Robertson, Ltd., 20 St. Nicholas St., Montreal, are doing the engineering for the St. Paulin development on the River du Loup en Haut. The contract will be awarded shortly.

Toronto, Ont.

On Nov. 26, Dr. L. W. McKeehan of the research laboratory of the Western Electric Company, New York, spoke in the Physics Building, University of Toronto, on "the electrical and other properties of metals as related to the arrengement of their atoms." The lecture was given under the auspices of the Royal Canadian Institute.

S. J. Ellis has been appointed permanent radio inspector for Toronto.

Vercheres, Que.

The South Shore Heat & Power Corporation contemplates building an extension to their transmission line from Ste. Julie to the Richelieu River, next spring.

Vancouver, B. C.

Canadian Westinghouse Co. are supplying two motors for elevator No. 2, to the Northern Construction Company, Ltd.

B. C. Electric Lulu Island trains are new running to the new station at Davie and Seymour Streets. Alterations to the station building are completed and the electric sign is now in place.

Mining activity at the head of Portland Canal has caused renewed enterprise on the part of the inhabitants of Stewart, the sensational camp of a decade ago, and it is now to have electric lights. Ben Lawrence and E. R. Workman have organized a company, bought machinery and secured water rights in Barney's Gulch. They plan to supply not only lights but power to the town and contiguous mining properties. Mining sections that it is intended to serve with power include Glacier Creek, where the large Dunwell mine is located, mines back of Stewart and possibly the Georgia River section, down the canal, where rich gold veins have been exposed.

Whitby, Ont.

Two hundred and fifty watt lights with special reflectors throwing the light each way along the road, supplied by the Ontario Hydro Commission are being tried out on the Kingston road by the Whitby Utilities Commission.

Windsor, Ont.

Announcement is made by the Windsor Hydro-Electric Commission that the Michigan Central Railway has contracted for 1,300 horsepower to serve the ice plant being built in the Windsor yards, which will have a capacity of 300 tons per day.

Sir Adam Beck's plan for building an auxiliary steam plant in the Border Cities will solve the very vexing problem of standby power for the Essex Border Utilities Commission's filtration plant, in the opinion of J. Clark Keith, engineer of the Commission. Present plans for the filtration plant contemplate electrically driven pumps, the current to be furnished by Hydro. Reservoir capacity provided in the plans is sufficient to care for the Border Cities' need for filtered water for from two to four hours, in event of interruption of power, Mr. Keith says.

York Township, Ont.

A letter was recently sent to the Hydro-electric Power Commission of Ontario by York township council asking for the estimated cost of taking over all distributions, extensions, etc., so as to establish a York Township Electric System.

Wiring Contracts Awarded

Brockville, Ont.

Beaton Davis Electric Co., 3 stores and apartments, $7,000.

Fredericton, N. B.

Vaughan Electric Co., St. John, N. B., $125,000 Memorial building.

Hamilton, Ont.

W. R. Kinney, 74 Lorne Ave., $20,000 house corner Queen & Glenfern.

Robinson Bros., $4,500 house, 119 Melrose Ave.

London, Ont.

Bowley Electric Co., $50,000 Sunday school and gymnasium.

Montreal, Que.

J. W. Tousignant, 637 Marie Anne St. E., flats at 1305 Chabot St.; store and apartments corner St. Lawrence Blvd. and Cremaissie St.

H. R. Cassidy, 225 Regent St., 2 houses, $20,000, Mire Ave. and Circle Rd.; $36,000 house on Mire Ave., Notre Dame de Grace; 3 houses, $30,000, on Glencairn Ave., Notre Dame de Grace; $10,000 house on Victoria Ave.; $20,000 house on Courte between Fort and Chomedy.

J. A. St. Amour, 2171 St. Denis St., $42,250 presbytery on Dorion St.; $35,000 residence on St. Joseph Blvd., between Fabre and Garnier.

Vincent & Say Electric Co., repairs to residence $25,000, at 443 University St.; $6,000 garage, 611 Rivard St.

Ottawa, Ont.

J. Ellicott, Bank and Strathcona, $5,000 house on Findlay Ave.

P. Ackroyd, 420 Bank St. $4,000 on Hinchy Ave.

W. Cherry, Victoria St., $4,000 house on Keefer St.

E. Headly, 44 Hopewell Ave., $5,000 house on Ossington Ave.

Marchand Electric Co., $14,000 apartment house on Butternut Ave.; $6,000 house on Grove Ave.

H. L. Allen, 272 Bank St., $14,000 house lot 35, Driveway; $5,500 house on Renfrew Ave.; $4,000 house on Huron Ave.; 2 houses, $10,000, on Branson Ave.; $6,000 house on Flora St.

Wallace Chugg, Bank and Second Ave., $12,000 house on Carling Ave.; $5,000 house on Russell Rd.

G. A. Young, Spruce St., $4,000 house on Grenville Ave.; $7,500 house on Fentiman Ave.; $7,000 house on Grove Ave.; $5,000 addition to residence Wilbrod & Chapel Sts., $6,000 house on Kenora Ave.

St. Catharines, Ont.

J. H. McLaren, Port Dalhousie, Ont., $3,500 house.

Saskatoon, Sask.

Wheaton Electric, alterations to warehouse at 136 Ave. A. S.

Toronto, Ont.

G. Sheppard, 338 Davisville Ave., 1 pair houses $7,000, south side Montgomery Ave. near Yonge; $4,000 huse at 43 Montgomery Ave.

Wm. J. Bovenizer, 409 Marguerette St., $3,000 house south side Woburn Ave., near Greer Rd.

C. Gray & Sons, 213 Sackville St., $4,500 house north side Woburn Ave., near Avenue Road.

Wm. Gibson, 156 Beech Ave., $4,000 house north side Riverdale Ave. near Pape Ave.

Harry Alexander, Ltd., $54,000 Sunday school and church, Ossington Ave.

E. Warman, 209 Soudan Ave., $7,000 house north side Alexandria Blvd.

G. Armstrong, 1217 College St., 4 houses, $4,000 each, south side Clements Ave. near Avenue Road.

Moss & Stocks, $5,000 house south side Alexandria Blvd. near Duplex Ave.

West London, Ont.

Knowles Electrical Co., $300,000 arena.

West Charlton, Ont.

Victor Brice, $3,300 church.

Windsor, Ont.

G. Campeau, 831 Wyandotte St., E., $8,000 duplex residence on London St.

New Henderson Stock-taking List

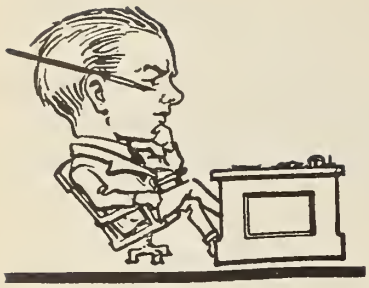
A new stocktaking list has been brought out by Henderson Business Service, Limited, Brantford, Ont. This compendium gives complete cost prices on all standard electrical materials, enabling the dealer to price his stock quickly without looking through catalogues, invoices, etc. It is entirely separate from the regular price service, and is used for inventory only. As every dealer takes stock and every item must be priced, this new departure of the Henderson Business Service should be of help. Contractor-dealers who have used the Henderson price service as a means of quickly and accurately determining prices, will find this new service an equally helpful and reliable way of determining costs.

Trade Publications

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued a 24 page booklet, entitled "A Material of Endless Possibilities," containing information about Micarta and the many uses to which it has been put, and indicating the possibilities for other applications. Some of the products for which Micarta is already used are bushings, cord terminals, discs, fan blades, gears, gaskets, handles, insulators, knobs, pinions pulleys, radio panels, switchboards, telephone apparatus, and washers.

The "Radio Work Bench" is a well illustrated booklet issued by the Federal Telephone & Telegraph Company, Buffalo, N. Y., that tells how to get results by the use of Federal parts.

"Secondary Construction of Proved Value" is the title of an interesting booklet recently issued by the N. Slater Co., Hamilton, Ont. The contents includes valuable information on methods of secondary construction, and should be of interest to any one who has to do with the construction or maintenance of a distribution system.



The Editor Comments

Why do They Leave Canada?

It is estimated that twenty-five thousand Canadians left this country for the United States during Novermer alone. This figure is an estimate, because the government apparently does not keep a record of people leaving the country for permanent residence elsewhere. Present efforts to bring more people in might well be supplemented by an endeavor to find out how many of our good citizens are going out—and why they are going.

Among that twenty-five thousand there were undoubtedly electrical men whose departure meant a real loss to Canadian industry. They have gone, and it is up to us to apply a remedy. A comparative statement of wages and living costs as between cities in Canada and the United States would do much to correct the condition. We can use that statement made by Roger Babson the other day—"Young men who go to the States may remain forever in salaried positions; if they stayed in Canada, and simply grew-up with the country they would eventually be able to buy and sell the other man ten times over." We can keep them, but we must move quickly. There is nothing wrong with Canada except the fact that we are slow— too slow to advertise our own country.

We Can Nail The Lie

On the first day of December, the Christmas shoppers turned out in force. The downtown districts were crowded, and a multitude of parcels and packages indicated that money was being freely spent.

In the front entrance of one large store, something unusual happened, on that Saturday afternoon. The crowd focussed there, and those in the outside edge pushed and struggled to get in and see what so fascinated the lucky ones in front. When they finally reached the inner circle, their gain was small—just a glimpse of a wisp of smoke coming from the vertical cast iron gratings beneath the windows. But they stood and looked, and presently every one of them had absorbed a brainless remark by a door attendant to the effect that "it was the electric wires that started the fire."

An electrical man who happened to be in that crowd felt that this was very likely another unjustifiable slur on the electrical industry. He investigated and found that the fire had started in a pile of dust behind the gratings. There was not an electrical wire within six feet of the spot. Such was the effect, but all those other shoppers could not know it. They drifted away and back to their homes, subconsciously or otherwise impressed with the idea that "electricity is dangerous." Every one of them was a potential buyer of electrical goods, and every one of them was unfavorably impressed by that incident.

The first cause of the unfounded rumor was, of course, the remark by the door-keeper. He simply parrotted a statement he had often seen in the daily press. That fact suggests a remedy. If every electrical man when he sees a fire reported as "due to defective wiring," makes an effort to investigate and get the facts, and then, if the rumor is baseless, protests to the editor of the newspaper, we shall soon succeed in preventing a great number of these slanders on the safety of electricity.

English Favor Demonstrations

Demonstration is the royal road to selling, as we are beginning to learn. Our English cousins are also acquiring the idea and the following extract from the Electrician, will interest Canadian readers: "The demonstration may usefully take place in a showroom, but if it can be effected in the home so much the better. There is however, an intermediate place which should not be neglected, especially having in view how important it is that the younger generation should be well acquainted with the electric idea. This intermediate place comprises the numerous training institutions throughout the country where cookery is taught as part of the curriculum. The housewife is conservative by nature. What she has been taught to use she will use, and a great deal of persuasion will be needed to make her change. At present most of these educational institutions are equipped with Victorian coal ranges or gas cookers, so that when the pupil in due course becomes a housewife she looks upon these as the only apparatus worth considering and is with difficulty convinced of the contrary. It should therefore be a part of the electrical propaganda, which everyone now recognizes as necessary, to see that all these institutions are fitted with electric cookers and other apparatus, and that both teachers and pupils are made acquainted with their advantages."

At the present time many of the schools in Canada are equipped with electric cooking apparatus, but the field is not by any means fully covered. That it is a

great deal worse in the old country may be inferred from the short article given elsewhere in this issue, telling of the receipt of a letter by Mr. E. V. Buchanan, of London, Ont., from a woman in Scotland, asking how to run an electric range.

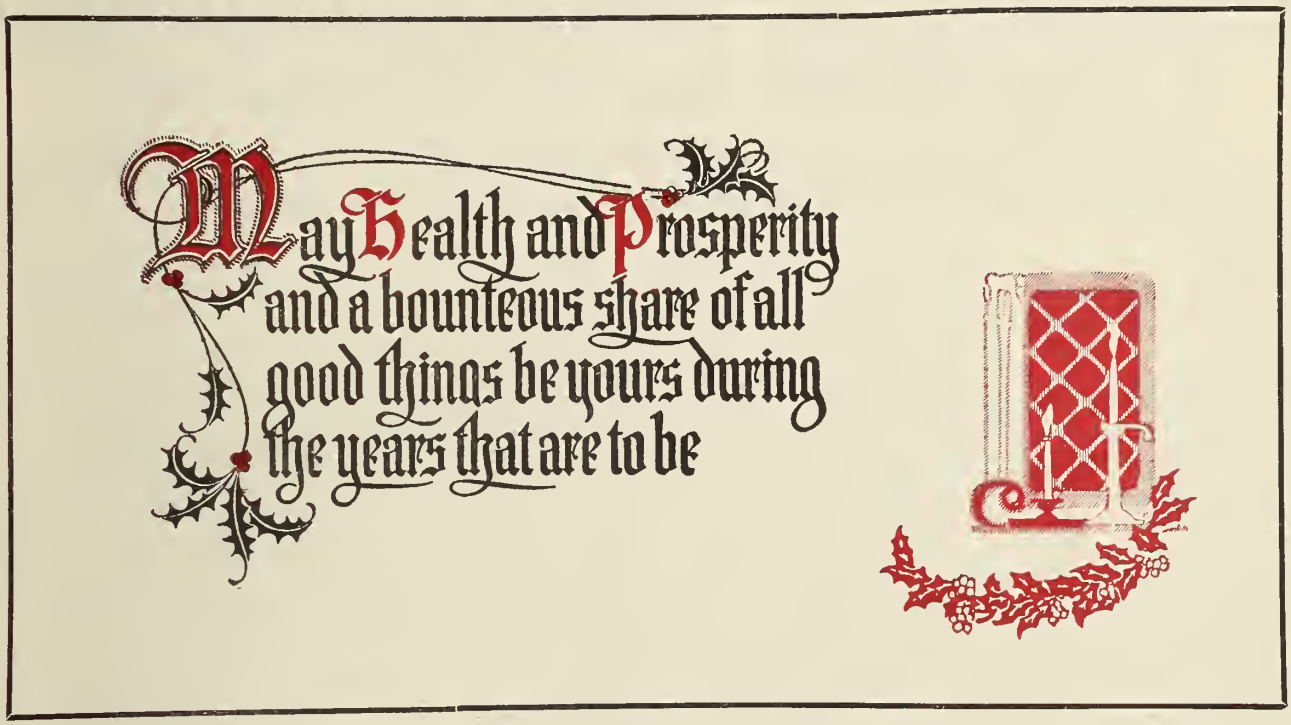
A Tip For The Salesman

A letter recently received by the Retail Merchants' Association reveals frankly the viewpoint of a retailer regarding the service of manufacturers' representatives. No doubt it voices the sentiments of a large body of retailers. Part of this letter is as follows:

"Every business day we interview one or more travellers representing the many firms. We are always glad to see them and make it a special point to be courteous but as brief as possible. We find, as a general rule, that the average traveller is not sufficiently clear cut and sharp in the introduction of his goods, and desires to talk about a lot of other matters before coming to the real issue. The days of offering the buyer a cigar, drink or chromo, are dead, and we feel that the days of the traveller desiring to tell a story or discuss the weather, with a lot of other trifles, are also dead. Merchants are busy men, or should be, and we feel that the travellers' conversation should commence about as follows: 'Good morning, Mr. Smith. My name is Jones, representing John Wilson & Co.' The average merchant has so many travellers calling upon him that he becomes confused as to what firm these travellers represent if some such introduction is not made."

Technical Schools Increasing

The past summer has witnessed a gratifying activity in the construction and equipping of technical schools. This trend for better equipped schools augurs well for the technical and practical training which is being made available on an ever increasing scale for rising generations. In this connection it would seem as if the electrical industry is not being overlooked but that ample provision is being made to give a thorough training in this important work. The equipment that goes into some of these schools is second to none, and gives the boys a taste of practical as well as theoretical conditions. Such courses are an undoubted necessity in this growing country and should be the means of producing an adequate supply of trained men.



Where Canada Stands

In water-power developed and use of electric energy the leading countries now stand in the following order:—

	Installed H.P. per 1000 of population	K-watt hrs. per capita
Canada	333	683
Norway	636	493
Sweden	260	364
Switzerland	260	364
U.S.A.	88	472

Thus Canada's position amongst the leading water-power countries in proportion to population is now third in water-power development and second in electric energy consumed.



Manitoba Power Blows Out Cofferdam Using 56,000 lbs. of Explosives

Demolition of Dam Surrounding New River Channel Adds 9½ ft. to Head of Great Falls Power Plant—24,000 cu. yds. of Material Removed

Some very interesting construction work has been carried out in connection with the Great Falls power development of the Manitoba Power Co. on the Winnipeg river. The nature of the scheme was thoroughly explained in the Electrical News of April 15, 1922, page 97, but to briefly review its salient features, it might be explained that the power house proper is located at Island No. 2, (see accompanying map) where the dam will hold the head waters above the power house at Elevation 808, thus forming a pond or peak load reservoir of approximately 2,000 acres in extent, providing a deep, wide and extensive body of water reaching upstream a distance of five miles and flooding out the existing rapids, thus obviating the trouble so often experienced in these northern latitudes from frazil ice, which forms in swift, turbulent water.

This dam at Island No. 2 raises the water level by forty six feet. The reach of the river below the power house was from thirty to ninety feet in depth, this level being maintained by a rock reef across the river at White Mud Falls 2½ miles below the power house. By excavating a channel through this reef, the entire reach of the river between White Mud Falls and the power site was lowered about ten feet, thus making a total operating head of fifty-six feet, for which head the turbines are designed.

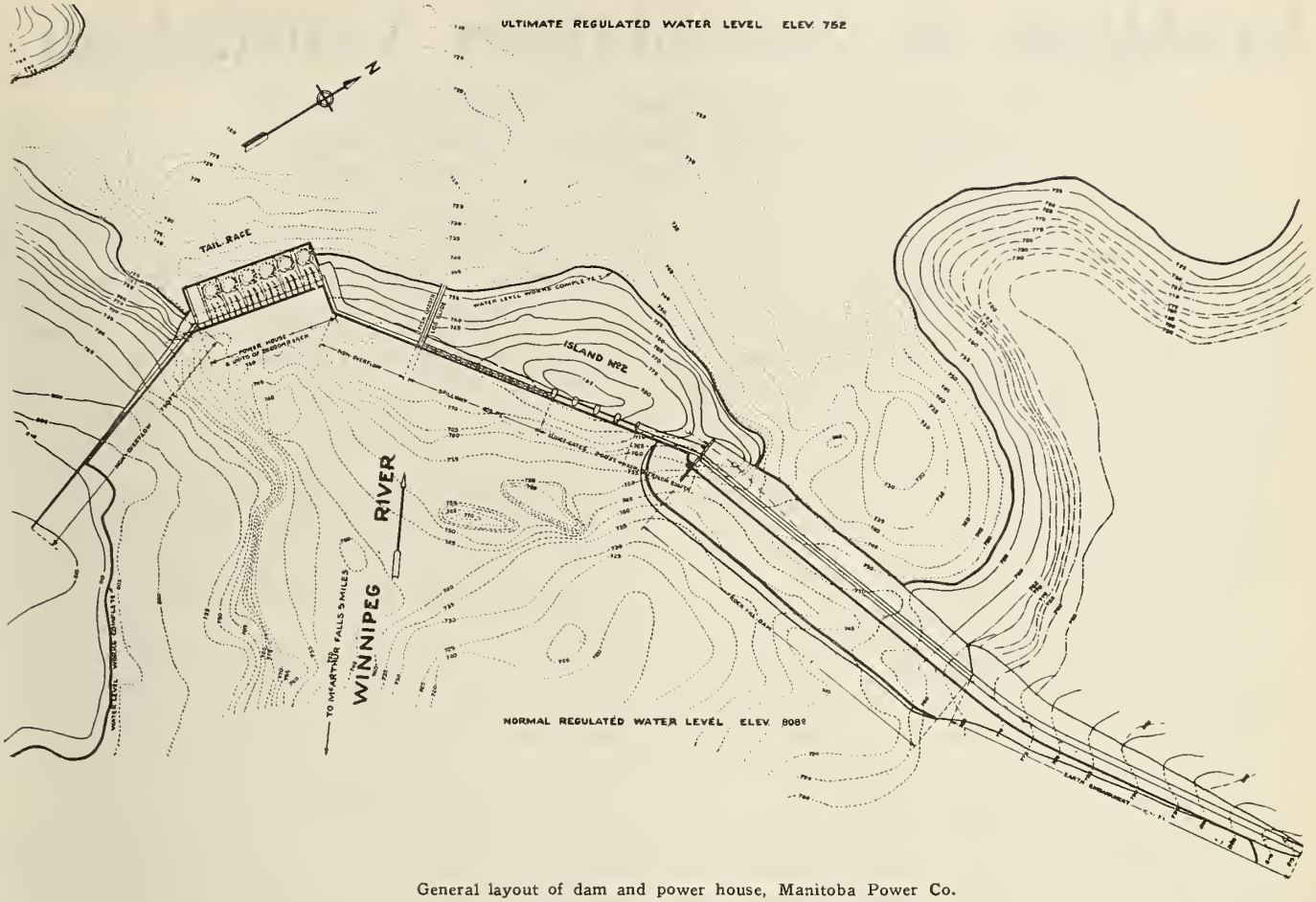
The concluding work in the construction of this channel was the removal by a charge of explosives of the cofferdams surrounding the site of the channel. The diversion of the entire flow of the river through this channel has increased the operating head on the Great Falls plant by lowering this entire lake level 9½ feet. The channel as excavated is 200 feet wide, 2,200 feet long and varies in depth from 5 to 30 feet below the original rock surface. Approximately 200,000 cubic yards of rock were excavated and used for constructing the main dam at Great Falls.

When work was initiated 18 months ago the site of this channel was enclosed by cofferdams composed of timber cribs, filled with rock and sheathed on the outside, and made securely watertight by a clay toe-fill. The entire enclosure was then pumped out and the excavation carried on behind this protecting dam.

52,000 Lbs. of Dynamite Exploded

On October 12th the work of excavating and clearing up the channel had been completed and the cofferdams at the upper and lower ends of the channel were undermined and heavily loaded with dynamite, so placed that on firing the charge the entire structure would be completely demolished. At midnight on that date the pumps were shut down and the area within the enclosure was allowed to fill with water. When sufficient water had entered the enclosed area to thoroughly tamp the explosives the work of dismantling the pumps, removing water pipes, air lines and other construction equipment was undertaken. This work was completed by 2.00 p.m. on October 15th, and all of the men employed on the work, with the exception of those detailed to fire the charge, entrained for Great Falls. Messengers were sent throughout the neighborhood to warn all settlers of the time of the explosion of the charge and whistles were blown continuously until the camp was cleared. When everything was in readiness for the blast a warning shot was fired and five minutes later, at 2.45 p.m., the charge of 14,000 pounds of dynamite was fired, completely removing the down stream cofferdam for a distance of 600 feet, containing a volume of over 4,000 cubic yards of broken stone, heavy timber and clay fill.

Immediately after this shot was fired a complete inspection was made of the wiring for the charge of the upstream cofferdam, and a second warning given to those in the vicinity. At 3.35 p.m. a warning shot was fired and at 3.40 p.m. the switch was closed, ex-



General layout of dam and power house, Manitoba Power Co.

ploding 38,000 pounds of dynamite and 4,000 pounds of black powder, completely removing the upstream cofferdam for a distance of 500 feet, containing a volume of 20,000 cubic yards of rock, heavy timber and clay fill, reaching in places a depth of 40 feet.

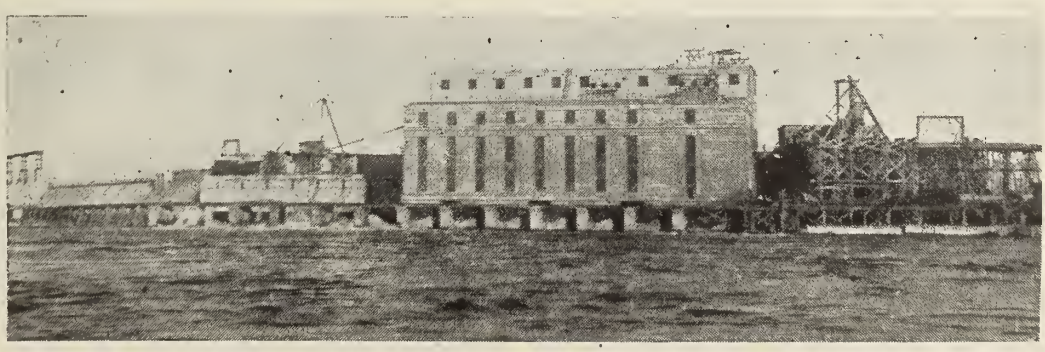
Permanent Works Nearly Complete

With the firing of the charge under the cofferdam the river was free to flow through the newly formed channel and by 7 o'clock the following morning this entire stretch of river had been changed, the level having been lowered 9½ feet.

With the construction of the White Mud Falls channel the permanent works, comprising the whole scheme of development, was practically brought to completion.

Wapella Power Plant Improved

The plant formerly owned by Mr. W. P. C. McDonald, has been taken over and improved by the town of Wapella, Sask. The new buiiing, 20 x 30, is reinforced concrete with wood and rubberoid roofing and was constructed by Mr. Alf. Bruce, contractor. The power equipment consists of two independent units, a 25 h.p. Fairbanks-Morse engine with 12½ kw. generator and an auxiliary 9 h.p. Hogg engine with 5 kw. generator. At present all stores and half of the residences are using the light. The plant was opened for business October 17, with Mr. A. Gillard in charge.



A downstream view of the power house

Problems of Sub-Station Ventilation

Increasing Size of Units Produces Demand for Forced Air Supply—Individual Blowers for Each Machine —Inlet Velocity—Ventilation of Battery Rooms

Electrical central and sub-stations often present some difficult problems for the designer. Due to the nature of electrical apparatus, air must be supplied to keep them cool. Any temperature rise above a specified normal may prove disastrous and consequently, the air cooling supply must be certain. Inasmuch as any temperature rise in the machines raises the temperature of the air in the station itself, the ventilation of the station is closely tied in with the ventilation or cooling of the apparatus.

A very comprehensive bulletin on this subject has been issued as a report by a sub-committee of the National Electric Light Association. From this report some extracts are given herewith.

Necessity for Mechanical Ventilation

The demand for constantly increasing sizes of transformer and converter units within floor areas no larger than were formerly used for the smaller units, has resulted in the introduction of mechanical means for removing the excess heat.

The manufacturers of transformers and rotary converters are insisting upon a strict compliance with the specification requirements for air and find the requirements so far demanded are in some cases below the actual requirements which experience has indicated.

Since it is required to operate these machines at their full overload capacity for short periods of time, it is a matter of prime importance to install ventilating apparatus that will insure satisfactory results.

Cencentration of Larger Units

In the large substations a capacity of 28,000 kilowatts has been confined within an area of approximately 4500 square feet or over six kilowatts per square foot. This construction of units is peculiar only to large cities, but has been worked out very successfully both from the standpoint of ventilation and also from the standpoint of feeder distribution.

The amount of air required under the specifications of the manufacturers in a station of five 4000 kw. converters based on 12,000 cubic feet for each transformer and 25,000 cubic feet for each rotary converter is 185,000 cubic feet of air per minute. All of this air must be handled mechanically and must be taken from points insuring reasonable cleanliness.

In order to guarantee each piece of apparatus its proper quantity of air, individual blowers must be introduced at each machine and a general system of exhaust must be introduced to prevent these individual blowers working against an abnormal pressure in the room.

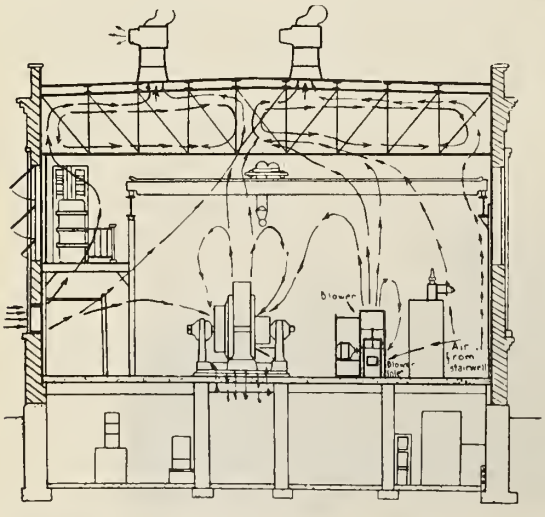
In selecting the point of admission for fresh air, care must be taken to avoid drawing any of the air over the sidewalk which is usually heavily laden with dust and such point must be remote from the point of discharge.

Air Washers

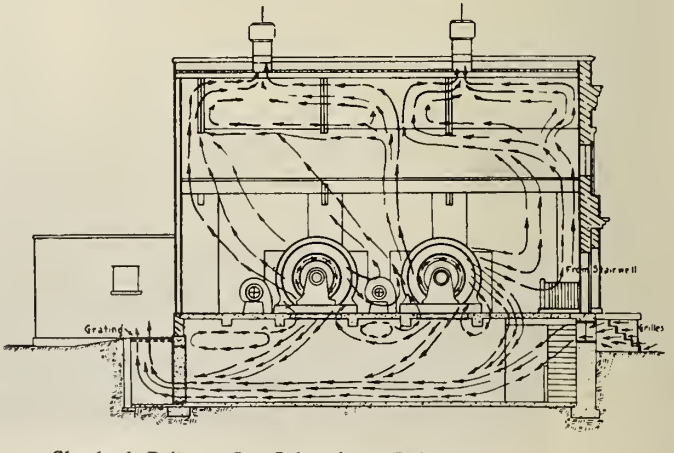
In many of the designs of the recent stations it has been found possible to provide a space in the basement near the point of admission from the rear of sufficient size to introduce an air washer. No air washer, however, has as yet been introduced and the question it still being debated as to whether an air washer will be required at any time.

Provision Against Snow and Rain

On account of the high velocity of the incoming air, rain and snow are drawn in, and in extremely cold weather, snow is frequently drawn in to the nearest machine. To provide against this shutters are introduced in the air passageway which may be quickly closed, cutting off entirely or throttling the incoming air. At the bottom of the air intake a



Right—Cleveland Railway Co. Substation. Automatic control—cross section



Cleveland Railway Co. Substation. Left—automatic control—longitudinal section

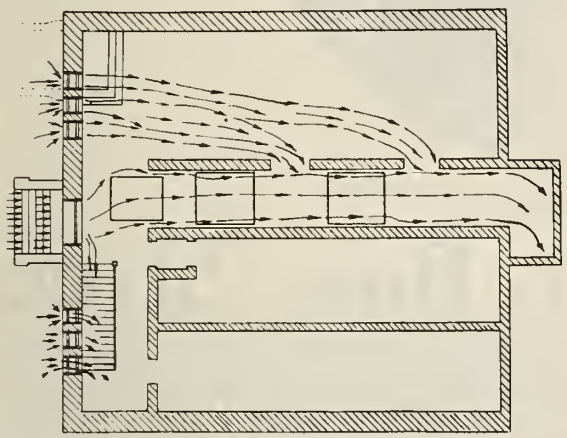
drain is provided connected directly to the sewer or a sump pit.

An effort is made to so design the inlet that an average maximum velocity of 1200 feet per minute will be insured.

The heated air from the various machines rises directly over each machine to the ceiling and the exhaust system must be so designed that this heated air can be picked out at various locations near the ceiling. Unless this be done, portions of the rooms, particularly those remote from the front openings, will be abnormally heated and the machines in the rear of the room will feel the effects of the high temperatures of the atmosphere of the room.

Duct Construction

The air duct in the rear leading into the fresh air chamber in the basement prevents the installation of windows and the only natural opening to the outer atmosphere is in the front of the room, which in hot weather is kept opened by the station operators. If the exhaust system which is frequently taken up in the front of the building is not distributed over the entire area of the room by means of ducts, there is the short circuiting of air from the front doors and windows directly into the exhaust duct, thereby defeating the purpose of the exhaust.



Cleveland Railway Co. Substation. Automatic control—plan of basement

The ducts that are carried over the ceiling of the converter room are made collapsible or removable wherever there are crane interferences. The exhaust duct passing up through the building to the blower pent house on the roof is built in with the masonry construction and plastered or finished smooth on the inside to reduce friction.

Vent on Roof

The warm air exhaust through the roof fans is in many cases discharged at points lower than the neighboring buildings and in the summer time when the windows are kept opened and the air is particularly warm, great care must be used to prevent annoyance to the neighbors. The exhaust must, therefore, be carried as nearly vertical as possible and located after carefully surveying the neighboring conditions.

Good results are often obtained by exhausting through holes in the roof without the introduction of pipes or ducts projecting above the roof. This removes the imaginary annoyance which the sight of an exhaust head might produce.

If the discharged air is delivered at a very high velocity, a very disagreeable noise is sometimes produced which annoys adjoining tenants, particularly at night time, and efforts have been made to provide a muffler which will not decrease efficiency.

The ventilation of a storage battery room is similar in many respects to the general ventilation of the rotary room or any other large room. The question of the number of air changes per hour must be determined by experience after observing the effects of a rapid charging or discharging of battery.

The principal problem in the ventilation of a battery room is to destroy the acid fumes before they are discharged into the atmosphere. Various forms of acid eliminators have been designed with more or less success. The introduction of a soda solution through which the acid fumes pass has shown that very little neutralization takes place and the best results have been obtained by a spray washer with fresh water and the standard form of eliminator plates. The acid eliminator must be introduced between the battery room and the fan, and even with the small percentage of acid which passes the eliminator, the fan rapidly deteriorates. A good acid proof paint will correct this trouble, but better results are obtained by a lead wash over the entire surface of the fan blades and the inside surface of the metal duct.

Selling Electric Trucks on Performance Record

When the Cullen Fuel Company of New York City required a new truck a few weeks ago they decided to try an electric. A six ton electric truck was purchased and its performance was watched in every detail. So satisfactory was this performance that at the end of a three weeks' trial a second truck was purchased and now the officials of the company are contemplating the addition of four more.

The following is the record which sold the Cullen Fuel Co. on electric truck operation:

10 day period	Average per day
226 miles	22.6 miles
252 tons	25.2 tons
335.3 kw.	33.5 kw.
$16.765 cost of current	$1,675 cost of current
.14 cost of grease	.014 cost of grease
.15 cost of vaseline	.015 cost of vaseline
No repairs	No repairs
56,952 ton miles	5,695 ton miles

New Generating Station at Tidewater, N.S.

The Nova Scotia Power Commission has recently signed a contract with the Albany Perforated Wrapping Paper Company of Albany, New York, to furnish that company at West River, Sheet Harbor, with 4,600 h.p. of electric energy. The price for this power delivered at 2,300 volts is about $21.30 per h.p. year. For the purpose of furnishing this power the commission will erect a second generating station on East River, Sheet Harbor. This station will operate at a head of about 100 ft. and will have an ultimate capacity of about 9,000 h.p. It will be erected at Tidewater about four miles below the development at Malay Falls, on the same river, which the Commission is just now completing.



Fig. 1—Reproduction of an illustration used in educational campaign for better street lighting

Bright Streets are Busy Streets

Necessity of Zoning of Street Lighting—Criticism of Ordinary Lighting Systems—Economy of Good Street Lighting—Increase of Property Values

By L. A. S. WOOD*
Manager, Street Lighting Section, Westinghouse Electric & Mfg. Company

City zoning of street lighting is important because street-lighting improvement schemes should be carried out under a comprehensive program co-ordinated with and included in city zoning plans. In designing ornamental street-lighting installations, the most important consideration is to obtain efficient illumination at night at low operating costs, with units which will add beauty to the appearance of the streets by day. The original cost of a street lighting installation is seldom greater than its cost of operation over a two-year period. Most installations last from ten to fifteen years, so it is plain that a little saved or spent on the original installation becomes an insignificant consideration when compared with the importance of wise planning from the standpoint of maintenance and operating costs.

In past years the usual practice has been to confine street-lighting improvements to limited areas. Just as city planning has in the past been almost wholly confined to scattering about the city a few beauty spots, such as civic centres, parks and playgrounds, so has improved street lighting been scattered through the agency of localized improvements carried out as private developments, or in the form of improvement districts. Nearly always the aim has been to boom a restricted area to commercial leadership through the establishment of "White Ways." The work of so-called improvement districts may be made valuable if regulated under a general improvement plan; but without centralized leadership the result is haphazard patchwork.

There are several causes for this "spotty" development in street lighting. One is the failure of the public in the past to realize and appreciate the importance of good lighting to the community. Municipal electrical engineers are the logical advocates of improved street lighting, but apparently political complications have in the past prevented their taking their place as leaders in this important branch of their work. Central station companies, sales departments, too, are logical advocates, but they seldom act in this capacity, and often an air of mystery and of sensitive political complications surround the street-lighting contract. In obtaining franchise renewals and in overcoming the propaganda of politicans trying to ride into office on a campaign aimed against public utilities, central station companies are often unjustly forced to use the street-lighting contract as a sedative. Consequently such contracts are often taken at a loss to the central station, and, naturally, no effort is subsequently made for a growth in an unprofitable load. Furthermore, to keep the street-lighting loss as low as possible, the equipment is neglected and fails to operate at normal efficiency. A low rate for street lighting may not always be an unmixed blessing to a municipality.

The average run of street lighting is more or less

*Condensed from paper presented before convention of I.A.M.E., September, 1923.

subject to the following criticisms which are approximately in the order of their relative importance:

1. Inadequate illumination.
2. Miscellaneous growth without a definite relationship to a comprehensive city plan.
3. Inconsistent transitions and gaps in passing from one section to another.
4. A lack of standardization.
5. A lack of classification of streets and an absence of unity of treatment of streets of the same classification.
6. Too many unsightly and disfigured streets, because of insufficient attention to architectural grace and ornamentation.
7. Too much temporary construction instead of building for flexible permanence.
8. Too little application of correlated effort, research and talent.

A scientifically derived, comprehensive, far-sighted street-lighting system program correlated with a city-zoning plan is not easily worked out. It calls for specialized talent in many lines of work, and, in most cases, city officials can profit by bringing into consultation the engineers found in public utility companies, whose success depends largely upon their ability to forsee future requirements and to meet them with a minimum loss in reconstruction. This nation is becoming possessed of many vast cities and most of them—like "Topsy"—"just growed." Our large industrial establishments and other privately owned projects exemplify the economy of employing talented engineers and architects. The city is, of course, more important than any of its contributing factors; yet there is in most large industrial establishments an array of engineering talent, with well thought-out

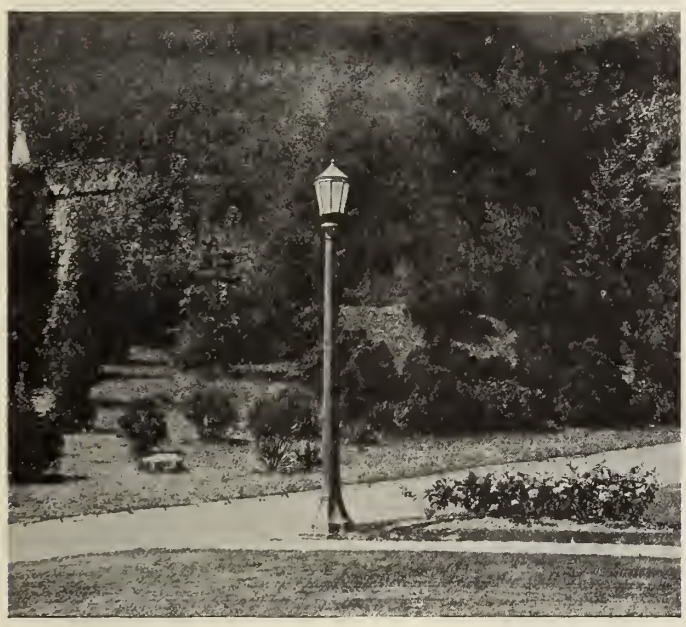


Fig. 2—An example of appropriate park lighting in Victoria Park, Niagara Falls

policies on research and development that is rarely found among the entire personnel of the average city's administrative body.

Anything is economical when the benefits which it produces are greater than its cost.

Street-lighting is not expensive. Statistics show that the average cost of street-lighting is only seventy-one cents per capita, and that the average expenditure for the fifty best lighted cities is only two dollars and four cents per capita. Compare this with the expense of running some of the other departments of civic government and consider the relative benefits derived from each.

In many cases after the installation of an adequate street-lighting system, it has been found that an actual saving has been made for the taxpayer. Because of the streets being well lighted, a reduction is possible in police, fire and other departments which more than offsets the cost of lighting. Of course, these are probably exceptional cases, but some saving can certainly be expected from these sources.



Fig. 3—Excellent street lighting in Lima, Ohio

Adequate street-lighting makes the community a more desirable place in which to live. The demand for both dwellings and business places is increased and property values are raised. The increase in real estate value will, in most cases, more than offset the cost of an improved street-lighting installation to the taxpayer.

Effect of Good Street-Lighting on Property Values

Statistics have been published in recent years which indisputably prove that well-lighted streets tend to decrease crime, and that traffic accidents on such streets are reduced. Little, however, has been published about the financial returns to property owners on an investment in a well designed street-lighting system. While this is one of the most obvious of the benefits of well-lighted streets, and was the inspiration for the earlier street lighting improvements, it is difficult to cite concrete examples. The following remarkable specific instance cited by Mr. Louis Zuckerman of the City Realty Co., Chicago, is of interest. Mr. Zuckerman, who has observed the effect of street-lighting on property values in Chicago for many years, states:

"Street-lighting sometimes determines, to a great extent, the values of business property. An example of this is the property at 4853-73 Broadway. This property was occupied as a coal yard for a number of years, and Broadway at this point was a poorly lighted street. The value was not over $150.00 per ft. The property, which is 261 feet wide, was improved with stores, and ornamental street lamps were installed in front of the property. The change has been such as to increase the ground value to $1,000 per ft."

Sub-Station and Garage Combined For Ottawa Electric Railway

An Interesting Innovation Needing Careful Design

The Ottawa Electric Railway Company, Ottawa, Canada, is constructing a building adjoining its Albert Street car barns, which will contain a modern sub-station on Albert Street and a garage on Queen Street. The building will be 200 ft. long and 35 ft. wide, with the substation entrance on Albert Street and the garage entrance on Queen Street. It will be of reinforced concrete, steel and brick construction and fireproof throughout, the interior being lined with pressed brick. The substation will have heat ventilator sky lights and an improved overhead travelling crane for lifting and moving the transformers and machinery. In the floor, concrete manholes, cable conduits and pits will be built. A Westinghouse commutating pole synchronous rotary converter of 2000 kv.a. capacity, 6 phase a.c., 600 volts d.c., will be installed in the sub-station next month. This is one of the largest of its type in Canada.

Special Features of Rotary

Special features of this rotary include a mechanical oscillator and speed limit device which automatically prevents the converter armature from running in one fixed position and thus eliminates grooves being worn by the brushes in the commutator and collector rings.

The direct current brushholders are especially designed to accommodate the brush lifting device mechanism. Each holder carries a carbon brush equipped with lifting lug and heavy shunts which relieve the spring from carrying current thus insuring long life and uniform spring tension on the brushes.

Power from Chaudiere

The rotary may be operated from two or three phase 60 cycle current. The power to operate the rotary will be taken from Chaudiere Falls at 11500 volts and carried in a paper insulated lead covered cable underground to the switchboard in sub-station, where a bank of lowering transformers will step down to 445 volts a.c. end, giving 600 volts d.c. end. These lowering transformers are designed with special connection for starting up and also for running.

The switchboard will consist of two panels; the high tension panel and the d.c. panel both black marine finished slate with angle iron frame and channel iron base. On the high tension panel will be mounted the meters, relays, remote control circuit breaker handles. On the d.c. panel will be mounted the circuit breakers, reverse current relays, meters, switches for the control of machine and feeder operation, negative, positive, feeders and equalizer. The circuit breakers on both panels will be full automatic.

Starting Panel

In addition to the main switchboard a special starting panel will be installed convenient to the rotary. On this panel will be mounted the switching equipment for starting up and running the rotary.

The 600 d.c. current will be carried in underground conduits in lead cable to the overhead trolley and feeder circuits and rail returns.

The garage will be used for the storage of the company's motor cars and trucks and will also contain the linemen's quarters as well as workshop and stores for the Line Department. Mr. M. C. O'Donnell, Electrical Engineer of the Company, will have his office in this building. The garage will be heated with an oil burning furnace and the building will contain all that a modern garage should have in the necessary equipment for repairing, cleaning and washing cars. It is expected that the building will be ready for occupation early in January.

Generators for Twin City Plant

The Ford Motor Company has ordered four Westinghouse 4500 kv.a., 13200 volt, vertical waterwheel generators with thrust bearings and direct-connected exciters. The generators will be installed in the hydro-electric station of the Twin City Plant of the Ford Motor Company at St. Paul, Minn.

The South Shore Light, Heat & Power Corporation, St. Julie de Vercheres, Que., with Montreal Office at 120 St. James St., has been incorporated. (Capital $99,000) to take over the business of La Compagnie D'Electricite du Comte de Vercheres, Ltd.

DESIGNER WANTED

Electrical designer wanted, one thoroughly experienced on high voltage water power station work. State full particulars to Box 439, Electrical News, Toronto, Ont. 24-1

FOR SALE

1—Fairbanks-Morse Duplex Piston Pump, 100 U. S. gals. per minute capacity. Suitable to pump to 125 lbs. pressure, driven by 1—10 H. P., 550 volt—3 Phase Motor. Mounted on same bed plate and connected by gear to pump. 1—Westinghouse Automatic Starter (Pressure Controlled) for same. Elmira Public Utilities Commission, Elmira, Ont. 20-24-1

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are best found by reading the Constructional Activity pages of the CONTRACT RECORD AND ENGINEERING REVIEW each week. Advance information on hundreds of buildings, homes, factories, etc., in every issue gives you an opportunity of writing or calling upon men who you know to be in the market for wiring and electrical devices. Subscribe today. Only $3.00 per year. Contract Record, 349 Adelaide St. West, Toronto. 13T.f.

SALES EXECUTIVE

An active, energetic man of wide experience and knowledge of the electrical industry, with a long standing connection from coast to coast. Capable of handling big business.

Will be open for an engagement after the first of the year.

Address: "Confidential,"
Box 436, Electrical News,
Toronto, Ont.

TRANSFORMER INSULATION

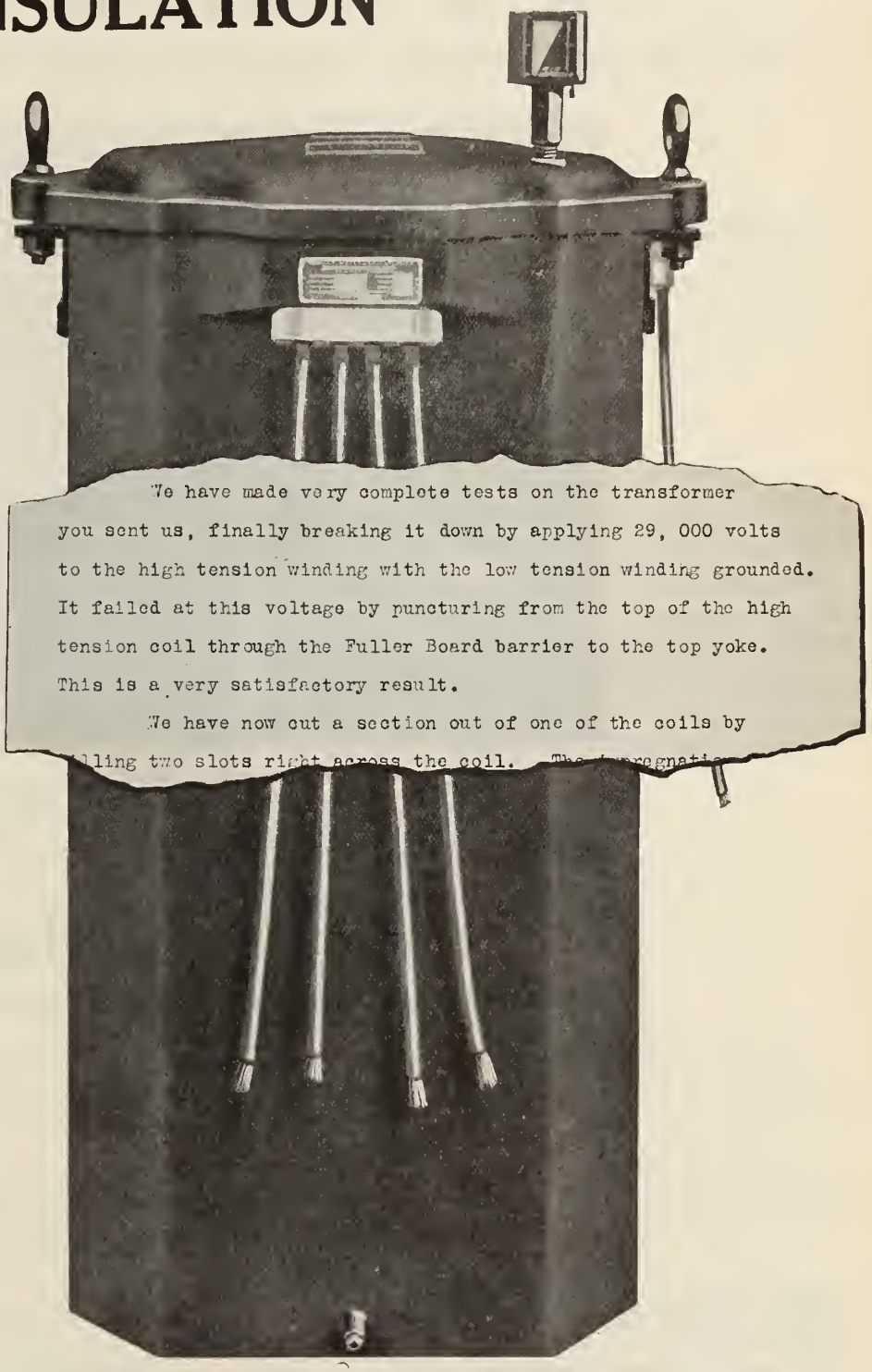
One of our standard 2200 volt, 10 KVA, pole type transformers recently shipped from stock, was subsequently tested to destruction by an outside Company.

It failed at 29,000 volts.



But even at 29,000 volts on a 2,200 volt lighting transformer, it didn't fail between primary and secondary.

If you can buy better transformers, by all means buy them.



FERRANTI METER AND TRANSFORMER MANUFACTURING COMPANY LIMITED

Head Office and Factory TORONTO, CANADA

You Can Create Consumer Demand at a Reasonable Cost

If You Use an Illustrated Tabloid Newspaper that is Eagerly Read

Advertising
10 cents a line $100.00 a page on contract only.



Circulation
guaranteed to be well in excess of 20,000 per week.

Photographs
can be reproduced most successfully.

Distribution
Toronto and suburbs, also nearby cities.

To advertisers interested in half-tone engraving and fine printing the above cut of Mme. Pavlowa is of special interest. Made and used in our issue of Nov. 24th., it is again used in this advertisement and herein faithfully represents the beautiful results we can obtain for our advertisers.

Buy on a Rising Market

Our Circulation is Jumping Every Issue

Early in November Toronto was startled by the advent of a new weekly newspaper. Tabloid in size (type 10¼ x 14 inches) and fully illustrated on a high grade of paper, this publication has jumped into almost instant favor.

Advertisers who have taken advantage of our pages have reaped a huge harvest of returns. Our rates are guaranteed until January 1st. but no longer as already our circulation warrants a higher rate.

Our representative will be pleased to call and explain our proposition fully.

ILLUSTRATED
NEWS MIRROR
The World as in a Looking Glass Reflected
Published Once a Week at 320 Bay Street, Toronto

Retail Marketing Tips

Washing Machines

—And How to Sell Them

15 Years Selling Electric Washers

Messrs. Culley & Breay Have a Definite Policy Based on Their Long Experience in Handling These Machines.

"ONE a week" is a very conservative estimate of average washing machine sales made throughout the year, by Culley & Breay, of Hamilton, Ontario.

This result does not represent any extra effort, or a specialized department. It is the ordinary turnover of washing machines in a business that carries on all the activities common to electrical contractor-dealers.

No canvassers are employed. This method has been tried out and found unsatisfactory because of the difficulty in obtaining reliable men. Every machine is sold to customers who come in the store and reveal themselves as prospects. Then follows a demonstration in the home that really sells the machine. Mr. A. S. Lawson generally conducts these demonstrations, and he explains the procedure as follows:

"Our first object is to instil confidence in the customer. We always make sure that she thoroughly understands the machine, and there are very few complaints. Satisfied customers send their friends to us."



"Our satisfied customers bring us other business"—a quotation that explains how washers can be sold without canvassing.

There's an Electric Washer to Suit Every Prospect in the Famous Connor Line



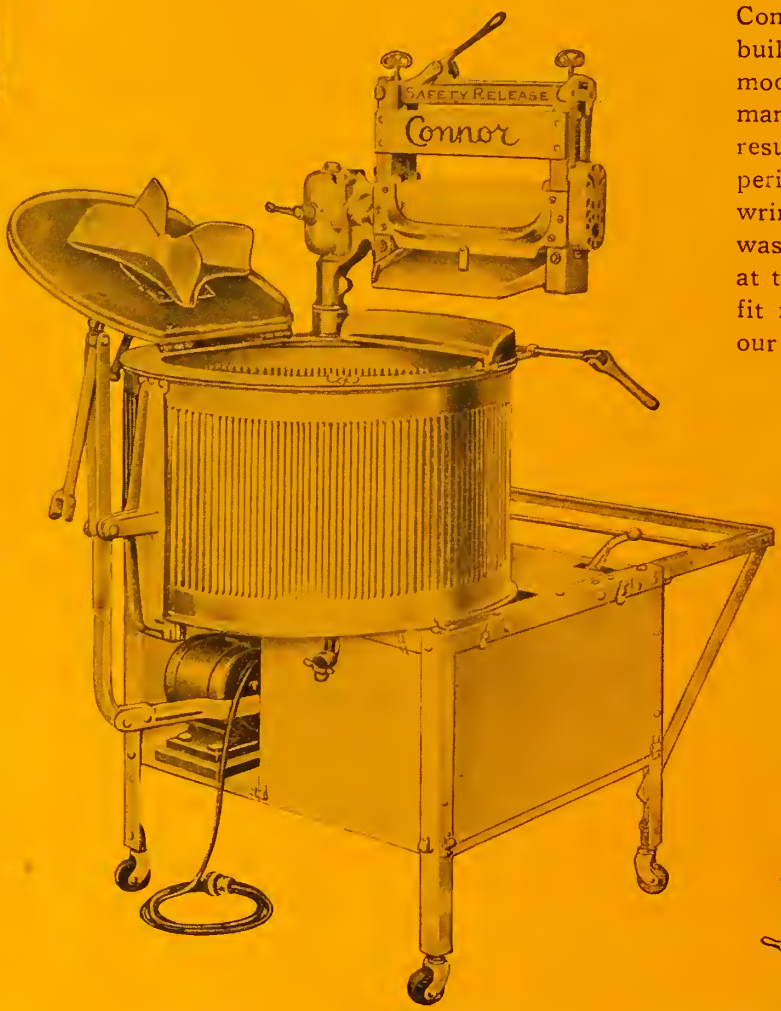
Connor Perfection Electric Swinging Wringer

Connor Electric Washers built in four different models, meet every demand. They are the result of long years of experience in washer and wringer building. Every washer guaranteed. Look at the prices, a good profit for dealer shown, get our trade discounts.

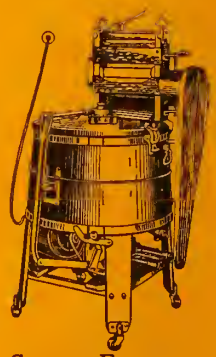
See This New One

MODEL 4C

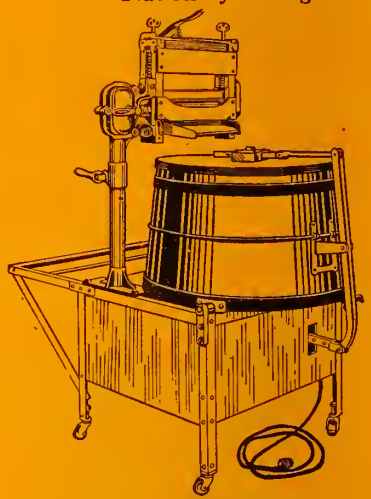
This latest addition to our line is filling a long-felt want. It possesses many special features—polished copper tub and polished aluminum cover, polished aluminum feed board and drain board of 12" swinging wringer, extension folding bench —these and many other special devices make an instant appeal.



The Connor Copper Tub Model 4C



Connor Economy Stationary Wringer



Connor Electric Model 2 Wood Tilting Tub Swinging Wringer

Mr. Dealer-- Ninety-Five out of One Hundred women you talk to, in your store or through your ads., use the dolly type hand or water power washer. When you show them the Connor four winged dolly, they know, from experience, you are right. Why not recognize the advantages of our four, different, models operating on same principle, meeting the buying ability of different people.

J. H. Connor & Son Ltd., Ottawa, Ont.

311 Chambers St., Winnipeg, Man.

1900

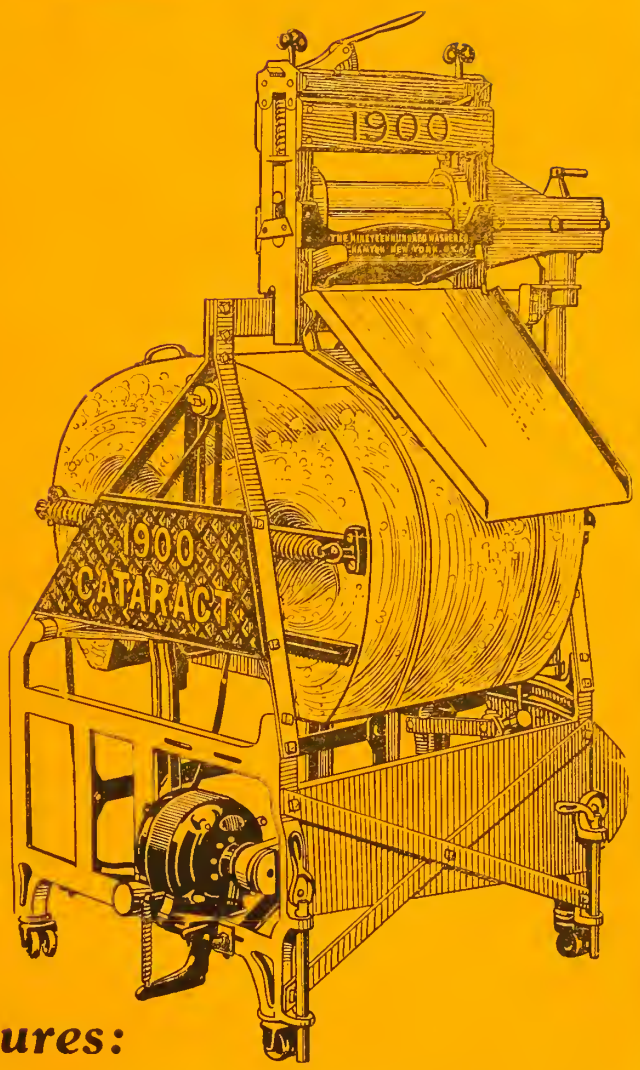
for 1924

Let's make it another good year for the "1900" Cataract Washer.

With so many features that make it an ideal washing machine and a boon to every home, you have in the "1900" a means of attracting many new customers, many more sales and considerable profit.

Link up with the success of the "1900". We offer you practical sales co-operation. Why not get together now on a big selling program for the New Year.

Write us today.



A Few of the 1900 Features:

Power transmitted from motor mounted on swinging base—by flat endless belt.

Reversible Wringer—shaft driven—adjustable to all required positions for use in connection with two washtubs.

Frame—extra heavy—all metal, mounted on casters with 4 adjustable lifting levers.

Tub—solid copper—detachable cover.

Wringer—Rock Maple Frame—extra quality white rubber rolls—all cog wheels enclosed. Equipped with safety release attachment.

Fast moving parts of driving mechanism fully enclosed running in oil.

Motor—Highest Standard of Quality—Special Design ¼ Horse Power.

BEATTY BROS. LIMITED

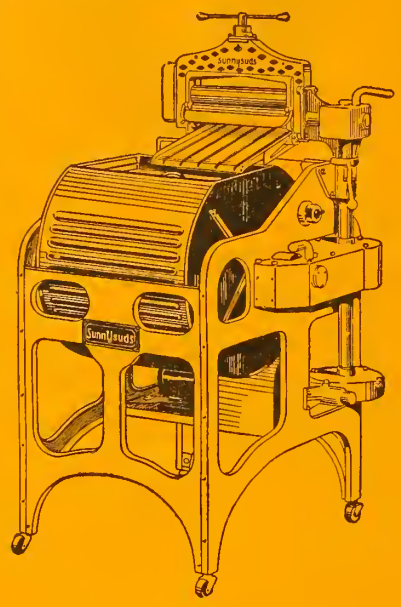
Head Office Fergus, Ont.

Largest Washer Manufacturers in the British Empire

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Sunnysuds for Christmas Gifts



You can make the next few days your best in point of sales and profits

Two weeks of intensive sales effort is going to pile up the profits for every dealer in the land who features the SUNNYSUDS WASHER. No gift is so acceptable to the hardworking housewife. No gift is more practical—more worth-while.

The SUNNYSUDS is well known, it is the logical choice, and a little extra effort on your part will make many a hesitating prospect "obey that impulse" and order one for Christmas. Put in "a window," get after them hard, there are only ten shopping days left.

Onward Manufacturing Company, Kitchener, Ont.



EUREKA

The Ideal Christmas Gift

Christmas giving doubles the number of your prospects. It puts them in a buying mood. Show them the ideal gift—THE EUREKA—and the sales and profits are yours. The next two weeks will see the biggest sales of EUREKA ELECTRIC VACUUM CLEANERS the trade has ever experienced. They are coming in now by the thousands. Get yours. Two weeks of extra effort will make your business jump.

This will be a Merry Christmas for all EUREKA dealers.

Dealers who are not already selling the Eureka should write for our proposition

Eureka Vacuum Cleaner Co.

KITCHENER, ONTARIO

KLITZEN

REGENERATIVE—

Receiving Sets

Real Radio Simplicity

Only one adjustment

Licensed under Armstrong Patents

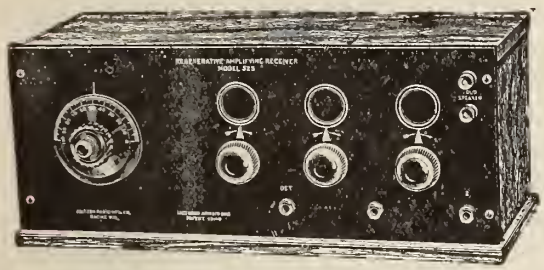
The principal feature of No. 525 Regenerative Tuner Detector, 2-stage audio amplifier is SIMPLICITY.

Any operator can get wonderful results because there is only one adjustment. Receiving Range practically the same as that of the best radiophone equipment on the market.

Each unit carefully tested before shipment. The best material and most highly skilled workmanship employed —it is the product of experts who have been making radio equipment since 1913.

JOBBERS AND DISTRIBUTORS. Write for full information and big discounts. DEALERS—ask your jobber or write us.

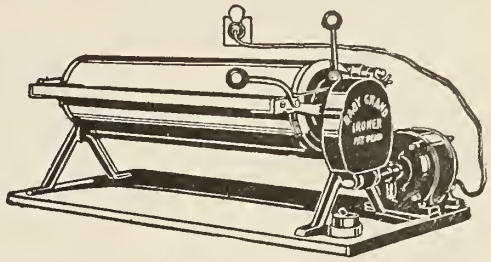
KLITZEN RADIO MFG. CO , Inc.
Racine, Wis.



MODEL No. 525

LIST PRICE $80.00

Small but Sells Big



Electrically heated

BABY GRAND IRONER

"A Household Necessity"

The steady increase in "Baby Grand" sales points to the nice profits which dealers are making. This market has scarcely been touched and now is the time to start getting YOUR share. A card will bring particulars.

INGERSOLL MACHINE & TOOL CO. LIMITED
Ingersoll, Canada

Toronto Office—230 Bay Street
Prairie Provinces:—Fred E. Garrett & Co., 501 Confederation Life Bldg., Winnipeg, Man.

SAY

We have something to tell you about Friction Tape and Splicing Compound



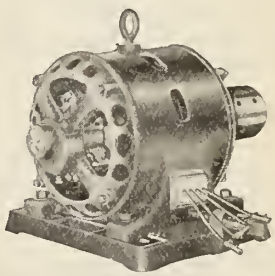
Write us at once for particulars and prices or phone
Main 6926

Dominion Engineering Agency Ltd.

D. M. Fraser, Pres., 24 Adelaide St. E., Toronto
Montreal District Representative:
E. W. Playford, 358 Beaver Hall Square

Century

Type "R S" Induction



Ratings ⅛ to 40 H.P.

Single Phase Motors

are so designed that the brushes touch the commutator only during the starting period, (from 5 to 15 seconds,) which insures long life for both commutator and brushes, and also quiet operation.

They Keep-A-Running

CENTURY ELECTRIC CO.

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Great West Electric Co. Ltd., Winnipeg
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Canadian Westinghouse Company
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Devoe Electric Switch Co.
Dominion Engineering Agency
Ferguson, Pailin Ltd.
Ferranti Meter & Transformer Mfg. Co.
Northern Electric Company

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Canadian Westinghouse Company
Radio Shoppe

CONDENSITE CELORON
(Sheets, Rods and Tubes)
Diamond State Fibre Co.

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L. & N. Co. Limited, The

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Conduits Company
L. & N. Co. Limited, The
National Conduit Company
Northern Electric Company
National Metal Molding Co.

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CONSTRUCTION MATERIAL
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CONTROLLERS
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Canadian General Electric Company
Canadian Westinghouse Company
Electrical Maintenance & Repairs Company
Northern Electric Company

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Canadian Westinghouse Company
National Electric Heating Company
Northern Electric Company
Renfrew Electric Products
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Hale Brothers
Northern Electric Company
Phillips Electric Works, Eugene F.

CROSS ARMS
Northern Electric Company

CRUDE OIL ENGINES
Boving Hydraulic & Engineering Company

CURLING IRONS
Northern Electric Company (Chicago)

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Canadian General Electric Company
Devoe Electric Switch Co.
G. & W. Electric Specialty Company
Moncur Electric Co., James

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G. & W. Electric Specialty Company

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Dominion Engineering Agency
Ferguson, Pailin Ltd.
Ferranti Meter & Transformer Mfg. Co.
Powerlite Devices Ltd.

DISPLAY STANDS
Barbeau & Co., L. C.

DREDGING PUMPS
Boving Hydraulic & Engineering Company

ELECTRICAL ENGINEERS
See Directory of Engineers.

ELECTRIC GRILLS
National Stamping & Electric Works

ELECTRICAL FIXTURE CHAIN
Wiggin & Co., Henry
Woodburn's Limited

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Canadian General Electric Company
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Equator Mfg. Co.
National Electric Heating Company
Renfrew Electric Products

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Wiggin & Co., Henry
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Jefferson Glass Company

ELECTRIC RANGES
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Canadian Westinghouse Company
McClary Manufacturing Co.
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Canadian General Electric Company
Northern Electric Company
Dominion Insulator & Mfg. Co.

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Canadian Drill & Electric Box Company
Devoe Electric Switch Co.

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Woodburn's Limited

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Nerlich & Company

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Electrical Testing Laboratories, Inc.

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Canadian National Carbon Co.

ENGINES
Boving Hydraulic & Engineering Company
Canadian Allis-Chalmers Company

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Canadian Westinghouse Company
Century Electric Company
Masco Company
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Aluminum
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St. Catharines, Ont.

W. Mackenzie E. A. Dodington

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No.	H.P.	Speed	Make
2	1	1800	Westinghouse
3	2	1800	T.H.E.
1	2	1800	Westinghouse
3	5	1800	Westinghouse
1	5	1800	T.H.E.
1	50	2200	Wagner—No starter

60 cycle, 3 phase, 220 volt, Second Hand Motors

1	1	1800	T.H.E.
1	2	1800	C.G.E.
1	2	600	C.G.E.
1	2	1800	Chapman Walker
1	7½	1200	T.H.E.
1	8	1800	T.H.E.
1	15	1800	Crocker Wheeler with Starter complete.

25 cycle, 3 phase, 550 volt

1	2	710	Century (new)
1	3	1500	T.H.E. (new)
1	7½	750	T.H.E.
1	10	1400	Imp. Electric with Starter complete.
1	40	710	Westinghouse CCL " " "
6	30	750	Crocker Wheeler " " "
1	15	1450	Westinghouse (new) " " "
1	50	720	Westinghouse H.S. " " "
2	50	750	Crocker Wheeler AQ " " "
3	20	750	Crocker Wheeler " " "

25 cycle, 3 phase, 220 volt, Second hand Motors

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1	35	750	T.H.E. with starter complete
1	40	720	C.G.E. with starter complete

Toronto and Hamilton Electric Co., Limited
HAMILTON ONTARIO

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Diamond State Fibre Co. of Canada, Ltd.

FIBRE (Vulcanized)
Diamond State Fibre Co. of Canada, Ltd.

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Slater Company, Limited, N.

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Masco Company
National Metal Molding Co.

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Banfield, W. H. & Sons
Crown Electric Mfg. Co., Ltd.
Canadian General Electric Company
Edmunds, J. H. & Co., Ltd.
Jefferson Glass Company
Joyner, Co. Ltd., Winter
National X-Ray Reflector Co.
Northern Electric Company
Powerlite Devices Limited
Tallman Brass & Metal Company
Wilton Electric Co., R. F.

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Paine Co. of Canada

FIXTURE PARTS AND FITTINGS
Banfield, W. H. & Sons

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Rawlplug Co., of Canada

FLASHLIGHTS
Canadian National Carbon Company
Spielman Agencies, Registered

FLEXIBLE CONDUIT
Canadian Triangle Conduit Company
Slater Company, Limited, N.
L. & N. Co. Limited, The

FUSES
Canadian General Electric Company
Canadian Westinghouse Company
Devoe Electric Switch Co.
Ferguson, Pailin Ltd.
G. & W. Electric Specialty Company
Moloney Electric Co., of Canada
Moncur Electric Co., James
Northern Electric Company

FROSTING
Arts Electrical Company
Barbeau & Co., L. C.
McKay Company

FUSE BOXES
Canadian Drill & Electric Box Company
Devoe Electric Switch Co.

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Canadian General Electric Company
Canadian Westinghouse Company
Electrical Maintenance & Repairs Company
Ferranti Meter & Transformer Mfg. Co.
Northern Electric Company
Thomson Company, Limited.
Toronto & Hamilton Electric Company

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Jefferson Glass Company
Wilton Electric Co., R. F.

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McGill Manufacturing Company

HAIR DRYERS
Canadian Fitzgerald Mfg. Co.

HANGERS (Cable)
Standard Underground Cable Co., of Canada Ltd.

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Kennedy, William & Sons
Smith Company, S. Morgan

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Star Porcelain Co.

HEATING DEVICES
Canadian Fitzgerald Mfg. Co.
Canadian General Electric Company
Canadian Westinghouse Company
Loutham Manufacturing Co.
Masco Company
McClary Manufacturing Co.
National Electric Heating Company
Northern Electric Company
Renfrew Electric Products
Security Electric Co.
Spielman Agencies, Registered

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Devoe Electric Switch Co.
Dominion Engineering Agency
Electric Power Equipment Corp.
Ferguson, Pailin Ltd.
Powerlite Devices Limited

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Kennedy, William & Sons

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Joyner, Co. Ltd., Winter
Jefferson Glass Company

INSPECTING ENGINEERS
Allen Engineering Company
Canadian Inspection and Testing Laboratories

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Canadian Westinghouse Company
Devoe Electric Switch Co.
Northern Electric Company
Norton Electrical Instrument Co.
Sangamo Electric Company of Canada, Ltd.
Powerlite Devices Ltd.

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Canadian Porcelain Co.
American Insulator Corporation
Diamond State Fibre Co. of Canada, Ltd
MacGillivray, G. L. & Co.
Mica Insulator Co.
Wiggin & Sons Henry
Woodburn's Limited

INSULATION (Hard Fibre)
Diamond State Fibre Co. of Canada Ltd.

INSULATORS
American Insulator Corporation
Canadian Porcelain Company
Canadian Westinghouse Company
Devoe Electric Switch Co.
Dominion Insulator & Mfg. Co.
Ferguson, Pailin Ltd.
Moloney Electric Company of Canada
Northern Electric Company
Wiggin & Co., Henry
Woodburn's Limited

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Canadian Line Materials Ltd.
Canadian Porcelain Co.
Slater Company, Limited, N.

INSULATING CLOTH
Packard Electric Company

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Canadian General Electric Company
Canadian Westinghouse Company
Flexible Shaft Company
National Electric Heating Company
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Canadian National Carbon Company
Canadian Westinghouse Company
Dalyte Electric Co.
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Lightolier Mfg. Co., Ltd.
Northern Electric Company
Wilton Electric Co., R. F.

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Canadian National Carbon Company
Edmunds, J. H. & Co., Ltd.
Joyner, Co. Ltd., Winter
Spielman Agencies, Registered

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Devoe Electric Switch Co.
Ferguson, Pailin Ltd.
Moloney Electric Company of Canada
Northern Electric Company
Slater Company, Limited, N.
Wiggin & Co., Henry
Woodburn's Limited

LINE MATERIALS
Canada Wire & Cable Co.
Canadian Bridge Company
Canadian General Electric Company
Canadian Line Materials Ltd.
Canadian Porcelain Company
Dalyte Electric Co.
Dominion Insulator & Mfg. Co.
Moncur Electric Co., James
Northern Electric Company
Slater Company, Limited, N.

LINE MATERIAL TOOLS
Oshkosh Mfg. Co.

LINEMEN'S SHIELDS
Linemen Protector Co.

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Canadian General Electric Company
Edmunds, J. H. & Co., Ltd.
Joyner, Co. Ltd., Winter
Northern Electric Company
Powerlite Devices Ltd.

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Slater Company, Limited, N.

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Canadian Westinghouse Company

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Canadian National Carbon Company
Canadian Westinghouse Company
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Lincoln Meter Company
Northern Electric Company
Packard Electric Company
Sangamo Electric Company of Canada, Ltd.

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Kent Brothers
Mica Company of Canada
Mica Insulator Co.

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Canadian Fitzgerald Mfg. Co.
Canadian Crocker-Wheeler Company
Canadian National Carbon Company
Canadian Westinghouse Company
Century Electric Company
Electrical Maintenance & Repairs Company
Ferranti Meter & Transformer Mfg. Co.
Northern Electric Company
Robbins & Myers
Sterling Electric Co.
Thomson Company, Limited, Fred.
Toronto & Hamilton Electric Company
Wagner Electric Mfg. Company of Canada

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Dominion Carbon Brush Company

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Ferguson, Pailin Ltd.

OUTDOOR SUB-STATIONS
Electric Power Equipment Corp.
Ferguson, Pailin Ltd.
Moloney Electric Company of Canada
Powerlite Devices Limited

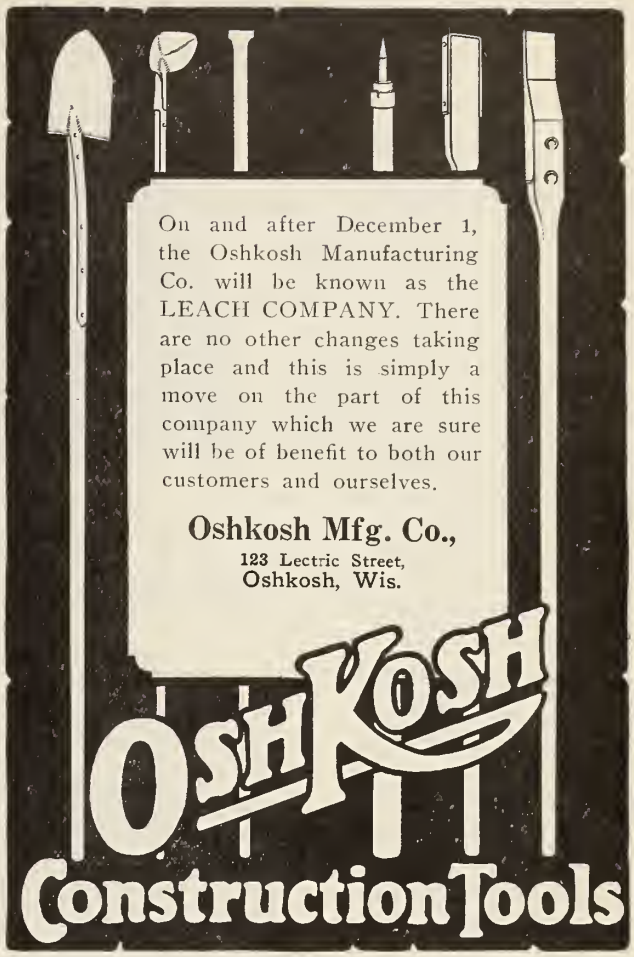
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Canadian General Electric Company
Canadian Porcelain Co.
Dominion Insulator & Mfg. Co.

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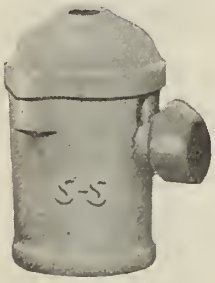
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OSHKOSH
Construction Tools



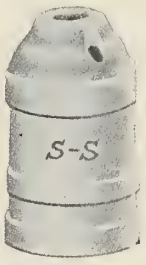
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Hale Brothers

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Lindsley Brothers Company
Northern Electric Company

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Canadian Porcelain Company
Northern Electric Company
Slater Company, Limited, N.

POLE TOP PINS
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Canadian Porcelain Company

PORCELAIN
Brunt Porcelain Co.
Canadian Porcelain Company
Dominion Insulator & Mfg. Co.
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Smith & Stone Ltd.
Star Porcelain Company
Wiggin & Co., Henry
Woodburn's Limited

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Farber, S. W.
Lightolier Mfg. Co., Ltd.

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G. & W. Electric Specialty Company
Northern Electric Company
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Standard Underground Cable Co., of Canada Ltd.

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Canadian General Electric Company
Devoe Electric Switch Co.
Electric Power Equipment Corp.
Kennedy, William & Sons
Ferguson, Pailin Ltd.
Powerlite Devices Limited

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Gilbert-Menzies Co., A. C.
Klitzen Radio Mfg. Co.
Marconi Wireless Telegraph Co.
Moss Schury Mfg. Co.
Myers Co. Ltd., E. B.
Radio Products Corp.
Radio Shoppe
Toronto Radio Co.
United Mfg. & Distributing Co.
Wallace Barnes Co.

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RADIO VACUUM TUBES
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Canadian General Electric Company
Diamond State Fibre Co. of Canada Ltd.

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Powerlite Devices Ltd.

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National X-Ray Reflector Company
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Devoe Electric Switch Co.

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Powerlite Devices Ltd.

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Devoe Electric Switch Company
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Ferguson, Pailin Ltd.
G. & W. Electric Specialty Company
Moloney Electric Co., of Canada

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Canadian General Electric Company

TRANSFORMERS
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Canadian Crocker-Wheeler Company
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Dongan Electric Mfg. Co.
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Northern Electric Company

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Canada Wire & Cable Co.
Moncur Electric Co., James
Northern Electric Company
Phillips Electric Works, Eugene F.
Standard Underground Cable Co., of Canada Ltd.
Smith & Stone Ltd.
Wiggin & Co., Henry
Woodburn's Limited

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Marr, W. P.
National Metal Molding Co.
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Standard Underground Cable Co. of Canada, Limited

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LOXON
LAMP GUARD
THE KEY TO SAFETY

THE strongly made **LoXoN** Lamp Guards protect lamps from breakage. A lock stops theft and prevents unauthorized removal or changing of lamps.

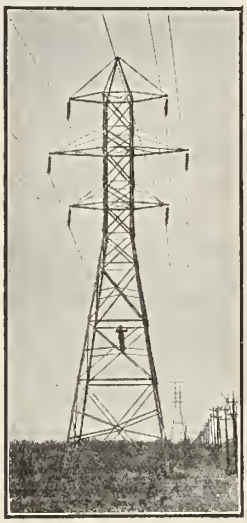
Keeping lamps where they belong gives control over lamps. A lamp guarded by a **LoXon** Lamp Guard is always ready for use when wanted. And, too, the average life of each lamp is greatly lengthened because none is taken away or broken for want of the guard.

LoXon Lamp Guards are made in several styles to fit lamps of different sizes and to meet individual requirements. It is economy to use them.

Write for complete descriptive catalog and prices.

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Electrical Specialties of Quality
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The modern means of supporting overhead wires.

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Trolley
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BRUSHES

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For ALL TYPES of Motors and Generators

Made in Canada

Orders shipped Promptly



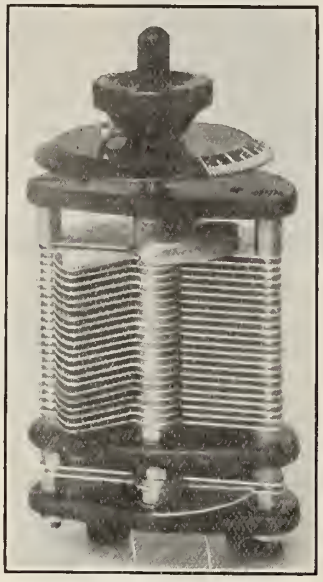
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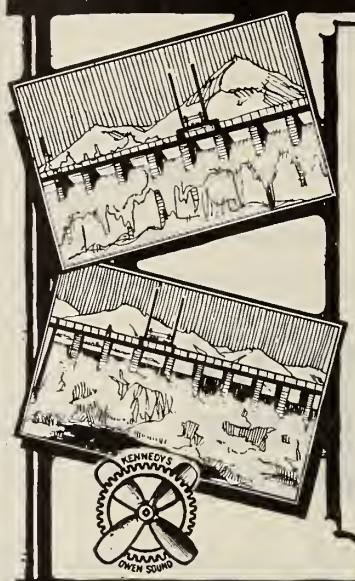
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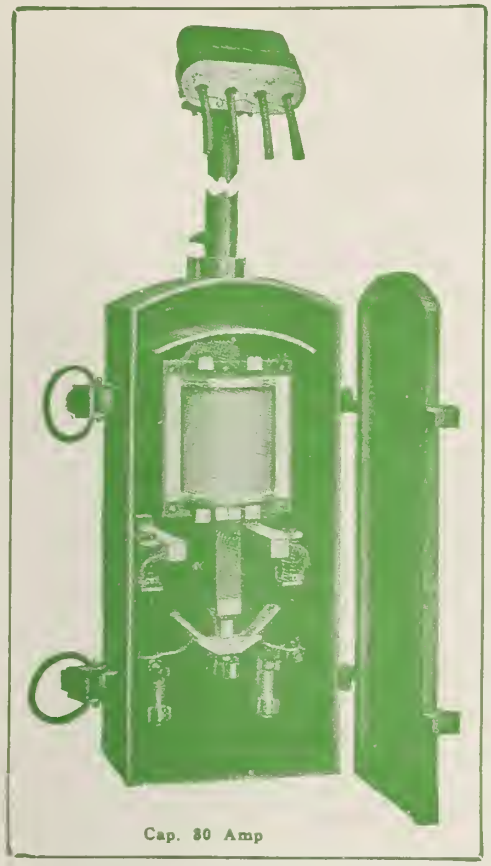
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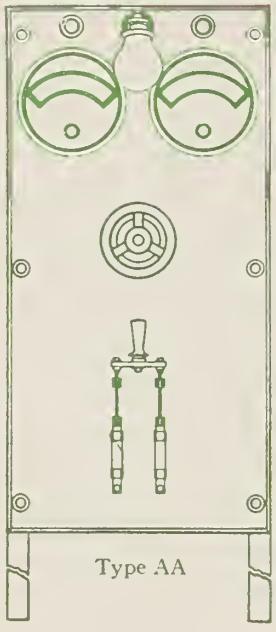
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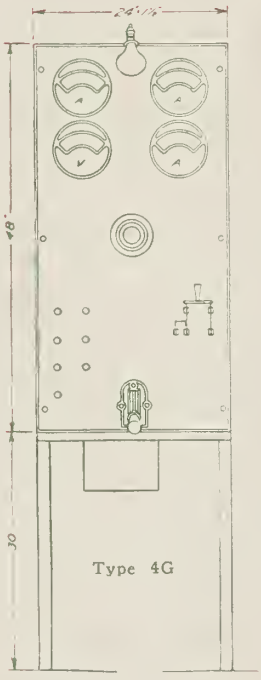
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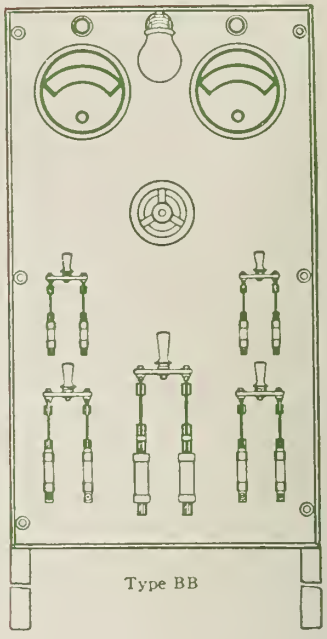
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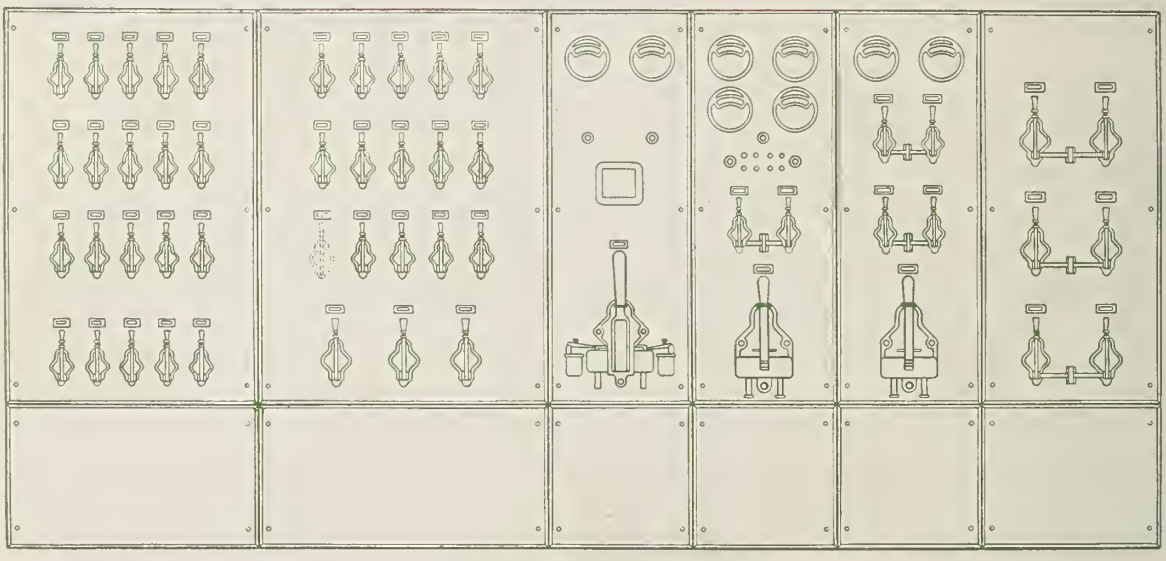
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